The PHOTOFACT® Servicer

SET 534 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JUNE 1961

CONTENTS PHOTOFACT SET 534

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
FLEETWOOD	
1001, 1011 (Ch. 1000, 1010)	534-1
WESTINGHOUSE	
Chassis V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2	534-2
PRODUCTION CHANGE BULLETIN	
MOTOROLA Tel. Rec.	
19P1-1, 19P1-2 (Ch. TS-432)	534-3
SYLVANIA Tel. Rec.	
Chassis 550-1, -2, -3, -7, -9	534-3
ZENITH Trans. Radio	
Royal 675L, LG (Ch. 6CT41Z5, 6GT41Z1)	534-3
OTHER EQUIPMENT	
CURTIS MATHES	
3016A, 3116A, 3216A, 3316A (Ch. 16A)	534-4
LAFAYETTE	
LA-210	534-5
MADISON FIELDING	
Series 440	534-6
MORROW	
CB-1, -2, -3, 5W1-6, -12, -117, 5W3-6, -12, -117	534-7
NORDMENDE	
Transita	534-8
OLSON	
RA-350	534-9
PETITE	
NTR-150	534-10
H. H. SCOTT	
314	534-11
SILVERTONE	
1065, 1067 (Ch. 528.54050, 528.59840)	534-12
WEBCOR	
W304-1	534-13

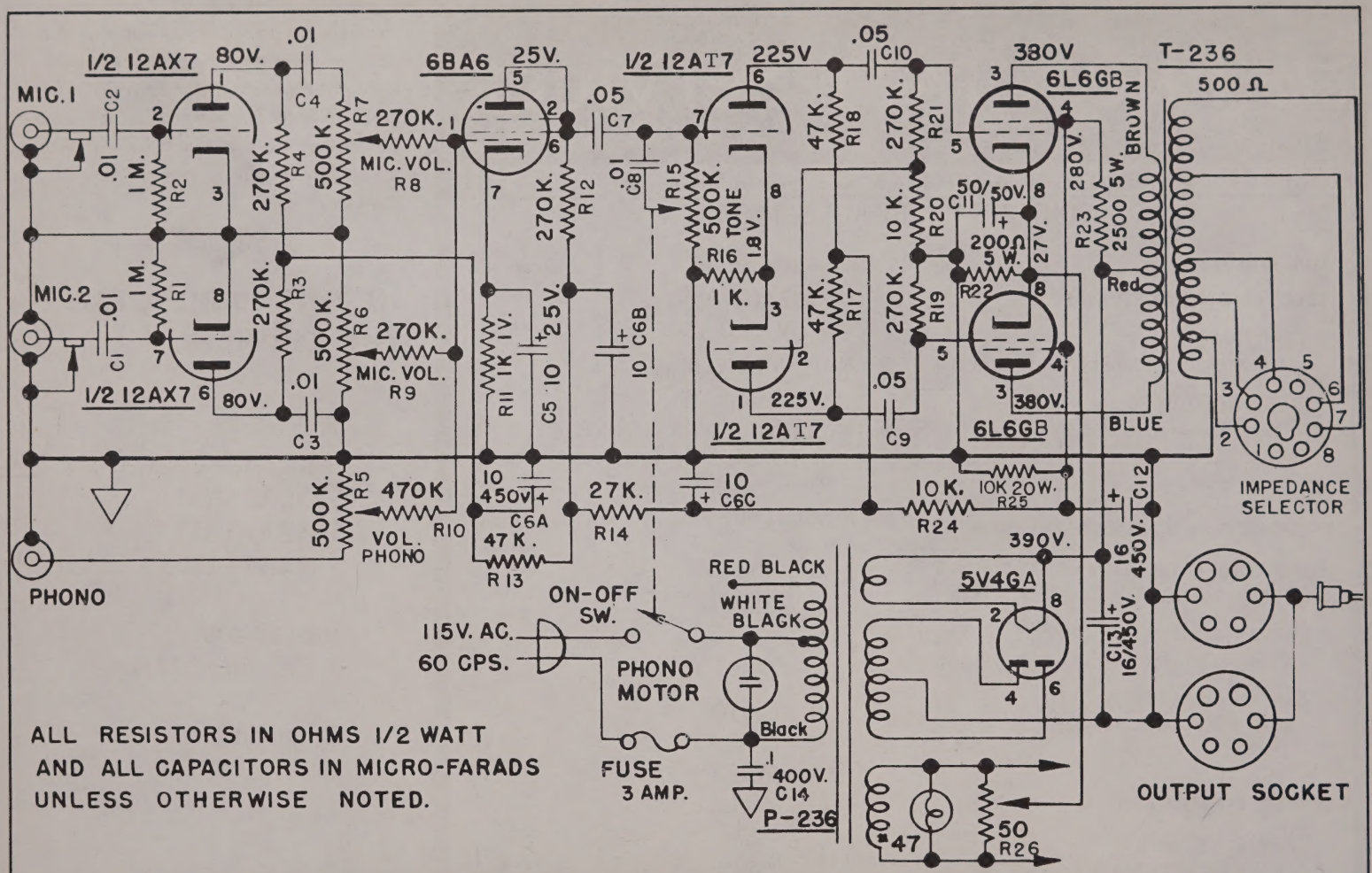
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Hallicrafters Models
5R30A, 5R31A,
5R32A, 5R33A,
5R34A (RUN 3)

Masco Model
Audiosphere 27

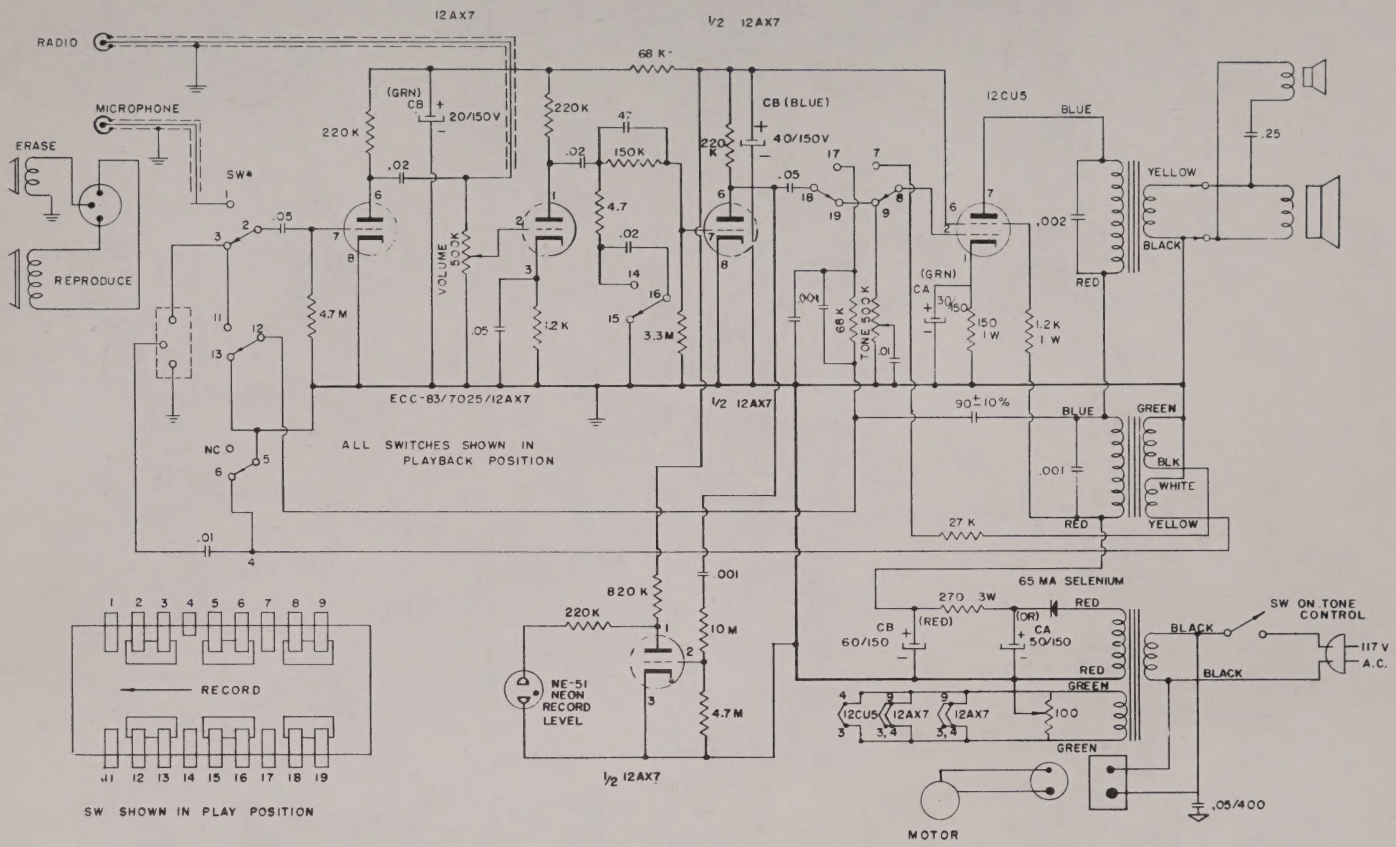
Symphonic
Model 230



ALL RESISTORS IN OHMS 1/2 WATT
AND ALL CAPACITORS IN MICRO-FARADS
UNLESS OTHERWISE NOTED.

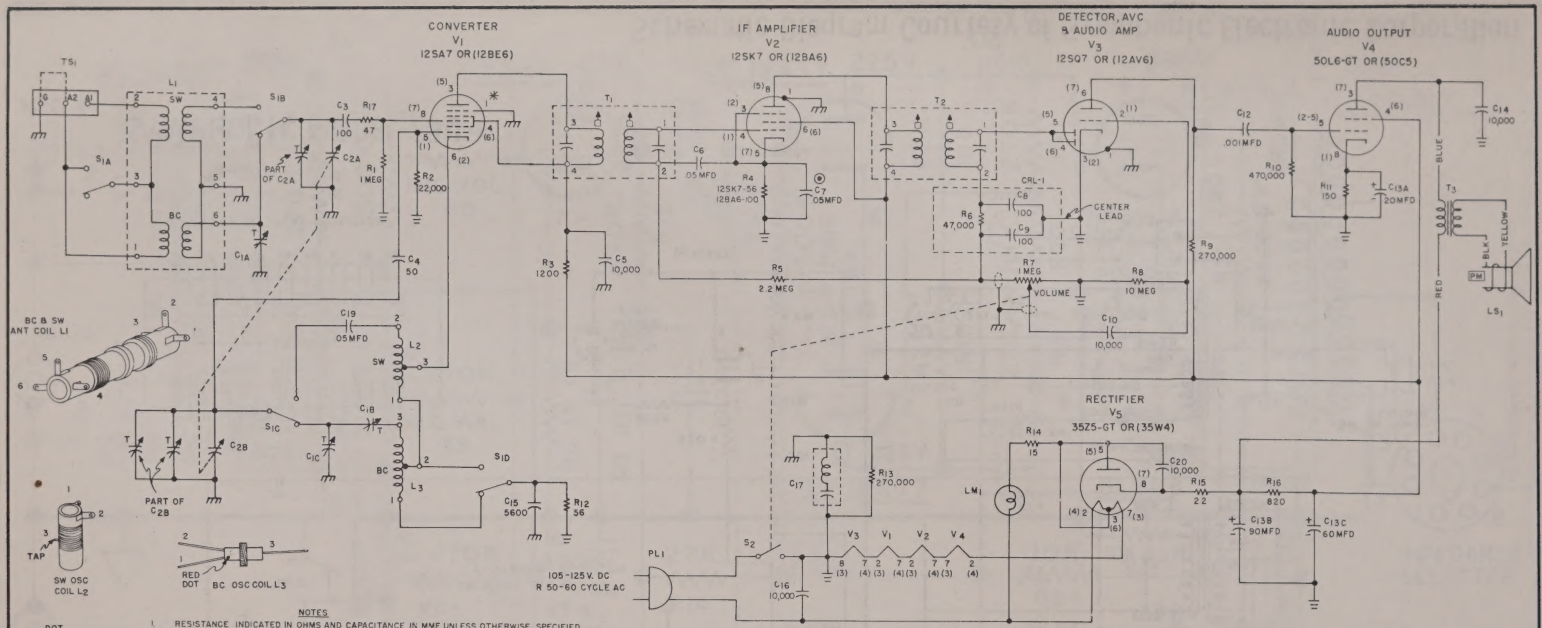
MASCO MODEL AUDIOSPHERE 27

Schematic Diagram Courtesy of Mark Simpson Mfg. Co., Inc.



SYMPHONIC MODEL 230

Schematic Diagram Courtesy of Symphonic Electronic Corporation



NOTES

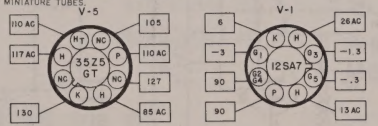
1. RESISTANCE INDICATED IN OHMS AND CAPACITANCE IN MMF UNLESS OTHERWISE SPECIFIED.
2. RESISTORS HAVE 1/2 WATT RATING UNLESS OTHERWISE SPECIFIED
3. INTERMEDIATE FREQUENCY = 455 KC
4. SW-BC SWITCH SHOWN IN BC POSITION (CLOCKWISE)
- CHASSIS
- B- (COMMON GROUND)
- GRID NO.5 OF THE 12BE6 IS CONNECTED INTERNALLY TO PIN (2)
- TUBE PIN NUMBERS ENCLOSED IN PARENTHESES ( ) ARE FOR THE MINIATURE TYPE TUBES.
- C7 IS OMITTED IN SOME SETS USING MINIATURE TUBES.

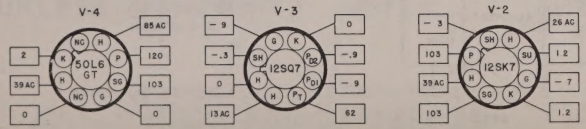
IF X'FMRS
T1 (#508524) B
T2 (#508525)

VALUES AND TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUE OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED

NOTES

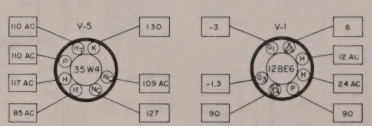
1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND B- (PIN 3 OF TUBE V-3) WITH ZERO SIGNAL INPUT, VOLUME CONTROL AT MAXIMUM AND TUNING CAPACITOR FULLY MESHED.
3. LINE VOLTAGE - 117 VOLTS AC.
4. ALL VOLTAGES ARE DC AND POSITIVE UNLESS OTHERWISE SPECIFIED. ALL VOLTAGES SHOWN AS AC WILL BE DC WHEN OPERATING FROM A DC SOURCE.
5. DC VOLTAGES WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM).

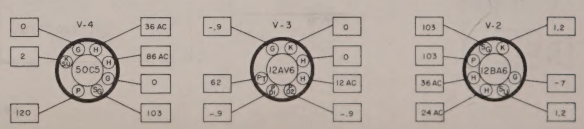




NOTES

1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND B- (PIN 3 OF TUBE V-3) WITH ZERO SIGNAL INPUT, VOLUME CONTROL AT MAXIMUM AND TUNING CAPACITOR FULLY MESHED.
3. LINE VOLTAGE - 117 VOLTS AC.
4. ALL VOLTAGES ARE DC AND POSITIVE UNLESS OTHERWISE SPECIFIED. ALL VOLTAGES SHOWN AS AC WILL BE DC WHEN OPERATING FROM A DC SOURCE.
5. DC VOLTAGES WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM).





HALLICRAFTERS MODELS 5R30A, 5R31A, 5R32A, 5R33A, 5R34A (RUN 3)

Schematic Diagram Courtesy of The Hallicrafters Co.

PHOTOFACT® Folder with CIRCUITRACE®

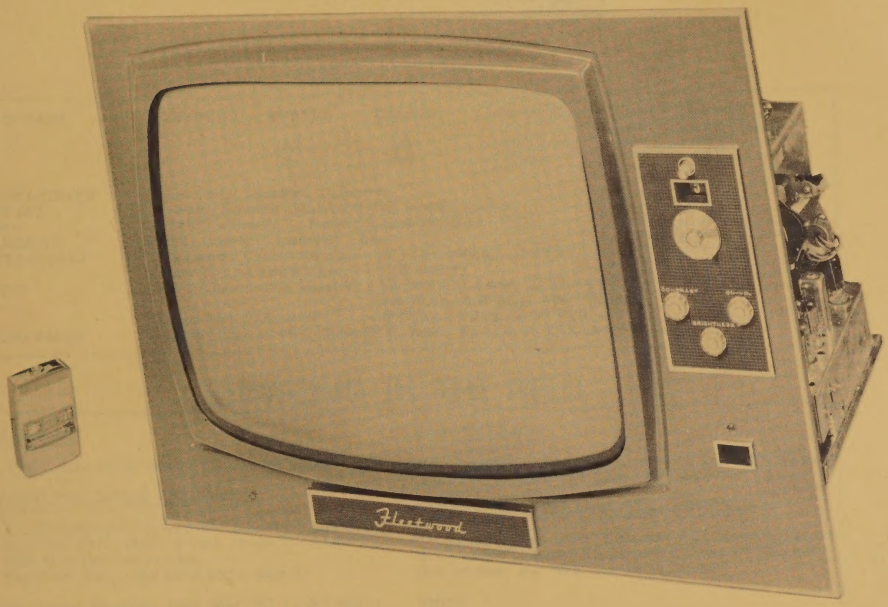
FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)



FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)

MODEL 1001 (CH. 1000)

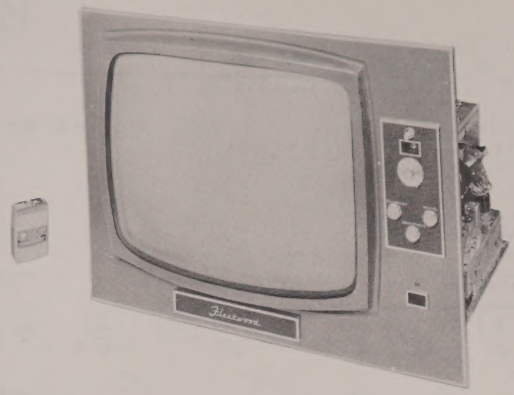
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PHOTOFACT® Folder with CIRCUITRACE®

FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)

FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)



MODEL 1001 (CH. 1000)

TRADE NAME	FLEETWOOD MODELS	CHASSIS	VHF TUNER	REMOTE CONTROL Receiver	REMOTE CONTROL Transmitter
	1001	1000	980001	109001	117001
	1011	1010	980001		
MANUFACTURER	Conrac, Inc., Glendora, California				
TYPE SET	Television Receiver (Model 1001 with Remote Control)				
TUBES	TV (VHF) - Twenty Remote Control Receiver - Four				
TRANSISTOR	Remote Control Transmitter - One				
POWER SUPPLY	TV & Remote Control Receiver - 110 - 120 Volts AC, 60 Cycle Remote Control Transmitter - 4.2V Battery				
RATING	TV & Remote Control Receiver - 240 Watts, 2.2 Amp. @ 117 Volts AC (260 Watts, 2.35 Amp. While Tuning) Remote Control Receiver - 18 Watts, .2 Amp. @ 117 Volts AC				
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)				

SERVICING IN THE FIELD

SAFETY GLASS

The safety glass is an integral part of the picture tube.

FUSE AND FUSE DEVICE LOCATION

TV: Circuit Breaker (LV Supply)-See Tube Placement Chart.
3/10 Amp. Fuse (Horiz. & Vert. Output Circuits)- See Tube Placement for location.
Fuse Wire (Fil.) - See M2 in photo, page 7.

Remote Control Receiver: Fuse Wire (Fil.) - See M12 in photo, page 13.

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, it is necessary to remove Channel Selector Knob.

DEFINITION CONTROL

Three Position Switch - See Tube Placement Chart.

AGC

The AGC may be varied by means of an Area Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus Control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Sync Noise Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Coil. (For location, see "Tube Placement Chart".)

HORIZONTAL LINEARITY

Linearity may be adjusted by a Coil Slug - see "Tube Placement Chart" for location.

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Control. (For location, see "Tube Placement Chart".)

CENTERING

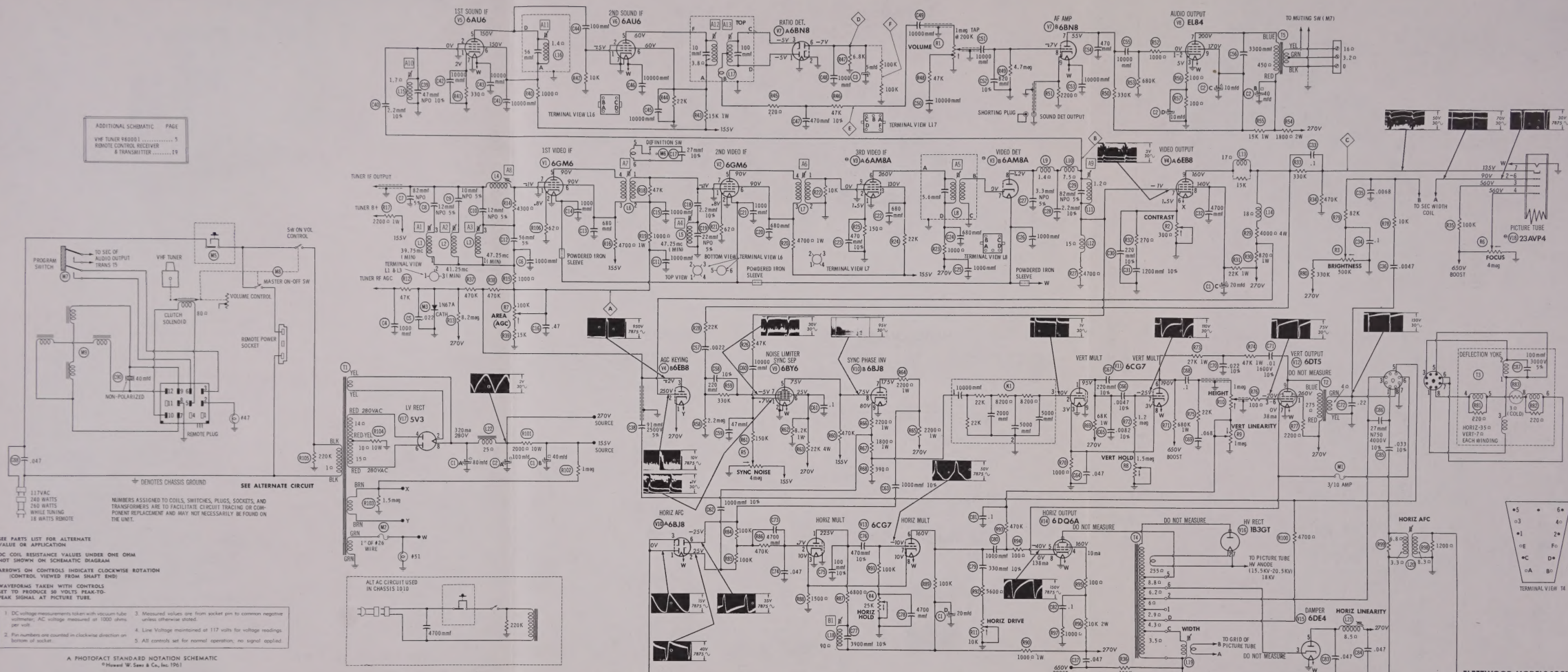
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

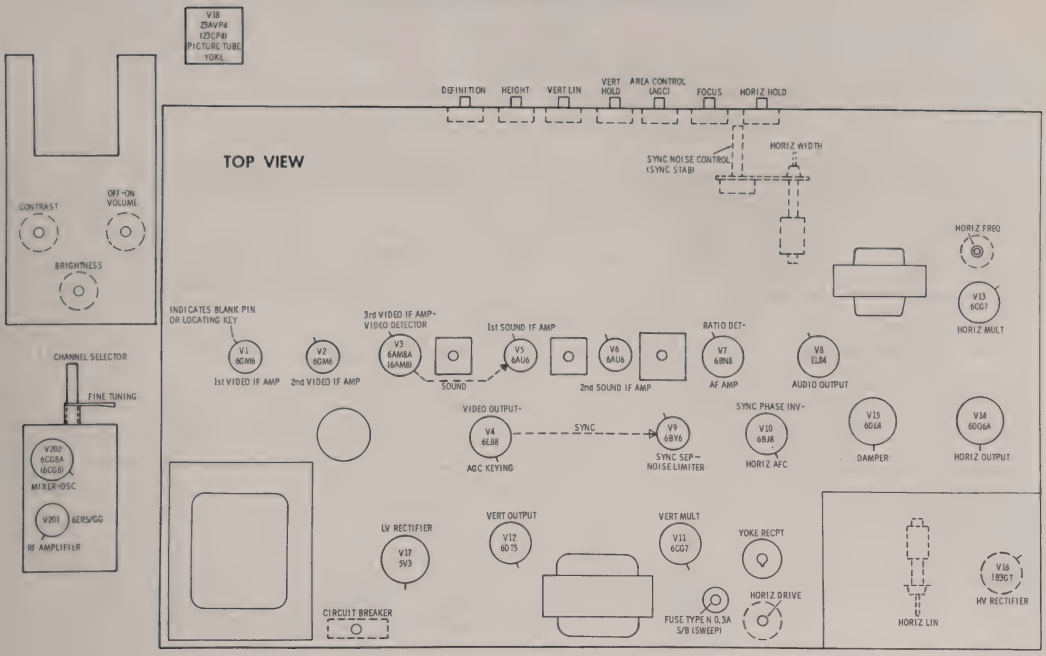
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KA732

SET 534 FOLDER 1


ADDITIONAL SCHEMATIC PAGE
VHF TUNER #80001 5
REMOTE CONTROL RECEIVER & TRANSMITTER 19
1ST SOUND IF V5 6AU6
2ND SOUND IF V6 6AU6
RATIO DET. V7 A6BN8
AF AMP V7 B6BN8
AUDIO OUTPUT V8 EL84
TO MUTING SW (M7)
VOLUME
SHORTING PLUG
SOUND DET OUTPUT
TERMINAL VIEW L16
TERMINAL VIEW L17
1ST VIDEO IF V1 6GM6
2ND VIDEO IF V2 6GM6
3RD VIDEO IF V3 A6AM8A
VIDEO DET V3 B6AM8A
VIDEO OUTPUT V4 A6EB8
DEFINITION SW
TUNER IF OUTPUT
TUNER B+
TERMINAL VIEW L1 & L3
TUNER RF AGC
POWDERED IRON SLEEVE
BOTTOM VIEW
TOP VIEW
TERMINAL VIEW L6
TERMINAL VIEW L7
TERMINAL VIEW L8
CONTRAST
BRIGHTNESS 500K
FOCUS 4meg
PICTURE TUBE V18 23AVP4
650V BOOST
TO SEC WIDTH COIL
AGC KEYING V4 B6EB8
NOISE LIMITER
SYNC SEP V9 6BY6
SYNC PHASE INV V10 B6BJ8
SYNC NOISE 4meg
AREA (AGC)
VERT MULT V11 6CG7
VERT MULT V11 6CG7
VERT OUTPUT V17 6DT5
DO NOT MEASURE
HEIGHT
VERT LINEARITY
VERT HOLD
DEFLECTION YOKE
HORIZ-35 Ω VERT-7 Ω EACH WINDING
3 Ω (COLD)
HORIZ AFC V10 A6BJ8
HORIZ MULT V13 6CG7
HORIZ MULT
HORIZ OUTPUT V16 6DQ6A
HV RECT V16 1B3GT
TO PICTURE TUBE HV ANODE (15.5KV-20.5KV) 18KV
HORIZ DRIVE
HORIZ HOLD
WIDTH
TO GRID OF B PICTURE TUBE
DAMPER V15 6DE4
HORIZ LINEARITY
650V BOOST SOURCE
LV RECT V17 5V3
320ma 280V
155V SOURCE
270V SOURCE
ALT AC CIRCUIT USED IN CHASSIS 1010
4700mf
220K
PROGRAM SWITCH
TO SEC OF AUDIO OUTPUT TRANS T5
VHF TUNER
SW ON VOL CONTROL
MASTER ON-OFF SW
VOLUME CONTROL
CLUTCH SOLENOID
REMOTE POWER SOCKET
NON-POLARIZED
REMOTE PLUG
117VAC 240 WATTS 260 WATTS WHILE TUNING 18 WATTS REMOTE
DENOTES CHASSIS GROUND
SEE ALTERNATE CIRCUIT
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
*Howard W. Sams & Co., Inc. 1961
TERMINAL VIEW T4
FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

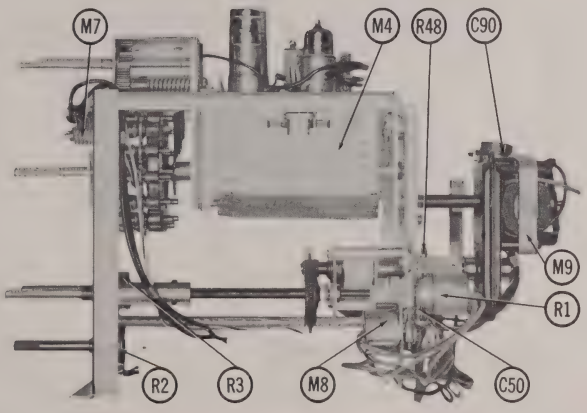
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Fuse (Fil.), V17

SWEEP FAILURE
No raster, has sound V13, V14, Fuse (Sweep), V15, V16, V18
No vertical deflection V11, V12
Poor vert. linearity or foldover V11, V12
Poor horiz. linearity or foldover V13, V14, V15
Narrow picture V13, V14, V15, V17
Vert. off freq. V11
Horiz. off freq. V10, V13

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V18
Has pic, no sound V5, V6, V7, V8
Overloaded picture V4

SYNC FAILURE
No vert. sync V9, V10
No horiz. sync V9, V10
No vert. or horiz. sync V9, V10



POWER TUNING—VHF TUNER—CONTROL ASSEMBLY

SET 534 FOLDER 1

ALIGNMENT INSTRUCTIONS
TV

PRE-ALIGNMENT INSTRUCTIONS

Disconnect Yoke Plug and set Definition Switch to "Normal" (center position).
The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .005mfd to Mixer Grid test point. Low side to chassis	Not Used	39.7MC	Any non-interfering channel	Use VTVM DC probe thru 15K to point (B). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	41.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3, A4	"
4.	"	"	43.5MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	42.5MC	"	"	A6	"
6.	"	"	45.5MC	"	"	A7	"
7.	"	"	46.0MC	"	"	A8	"
8.	"	"	42.0MC	"	"	Mixer Plate Coil	"
9.	"	44.0MC (10MC Swp.)	39.75MC 41.25MC 42.0MC 43.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. of scope thru 15K to point (B). Low side to chassis.		Check for response similar to Fig. 1 with markers as shown. If necessary retouch A1 thru A8 and Mixer Plate Coil SLIGHTLY for proper response. Reconnect yoke.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	High side thru .05mfd to point (B). Low side to chassis.	4.5MC (High Output)	Any non-interfering channel	RF probe to point (C). Common to chassis.	A9	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (E) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	High side thru .05mfd to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	*DC probe to point (E). Common to point (F).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

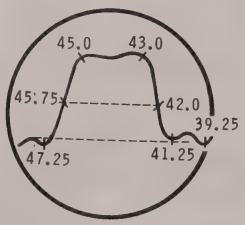
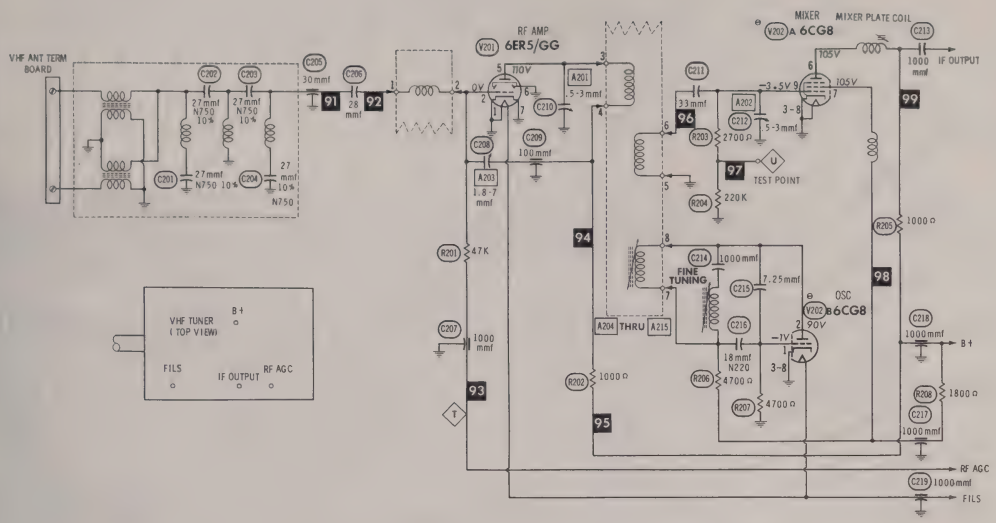


FIG.

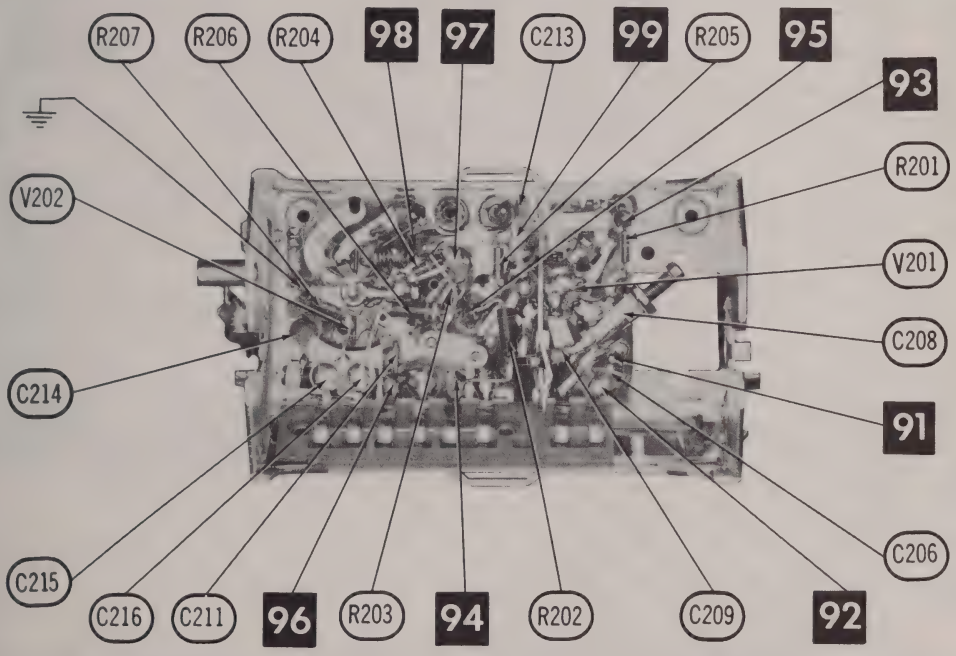
ALIGNMENT IDENTIFICATION PHOTOS PAGES 7, 20



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

©Howard W. Sams & Co., Inc. 1961

VHF TUNER 980001

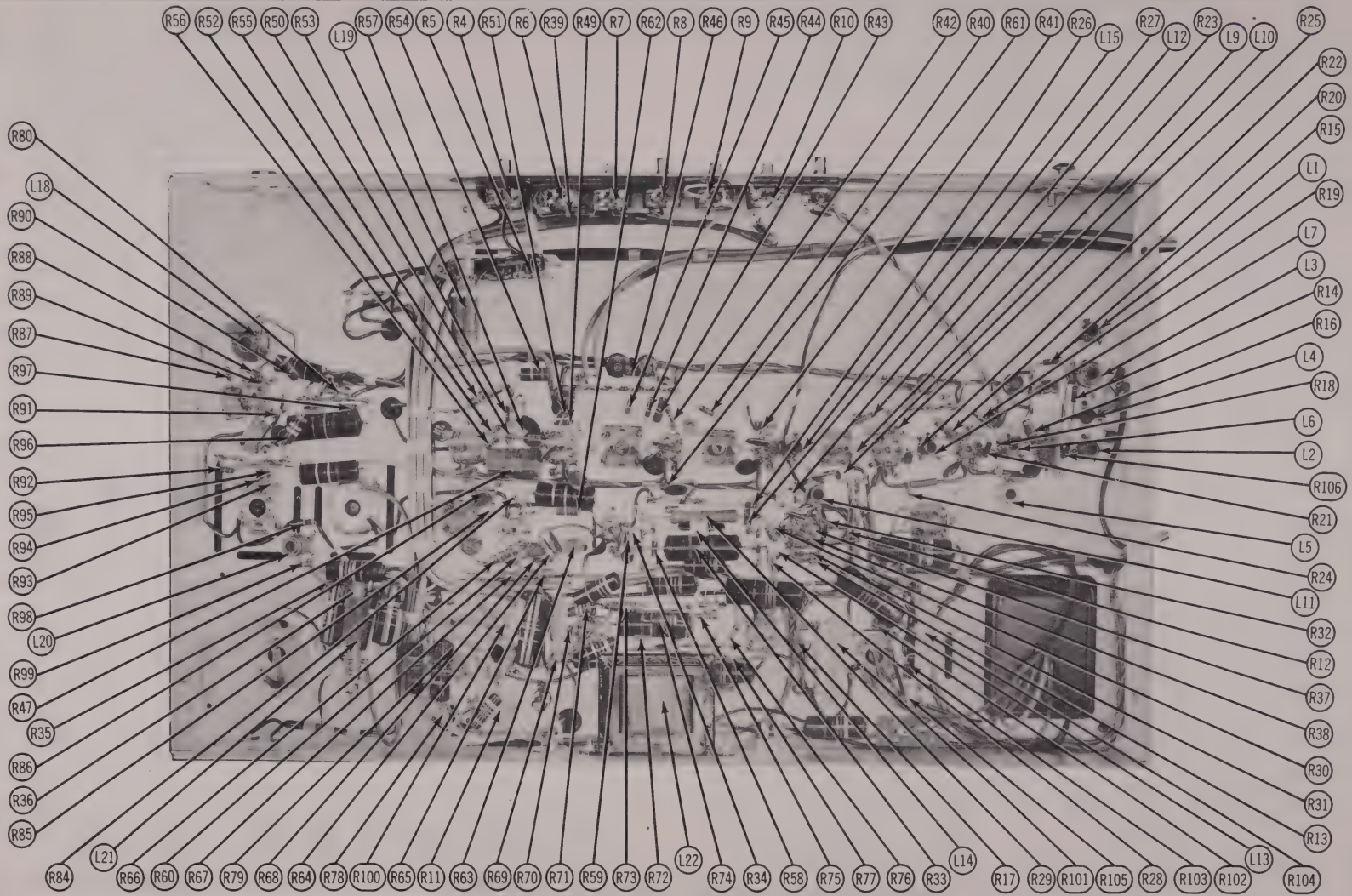


A Howard W. Sams CIRCUITRACE Photo

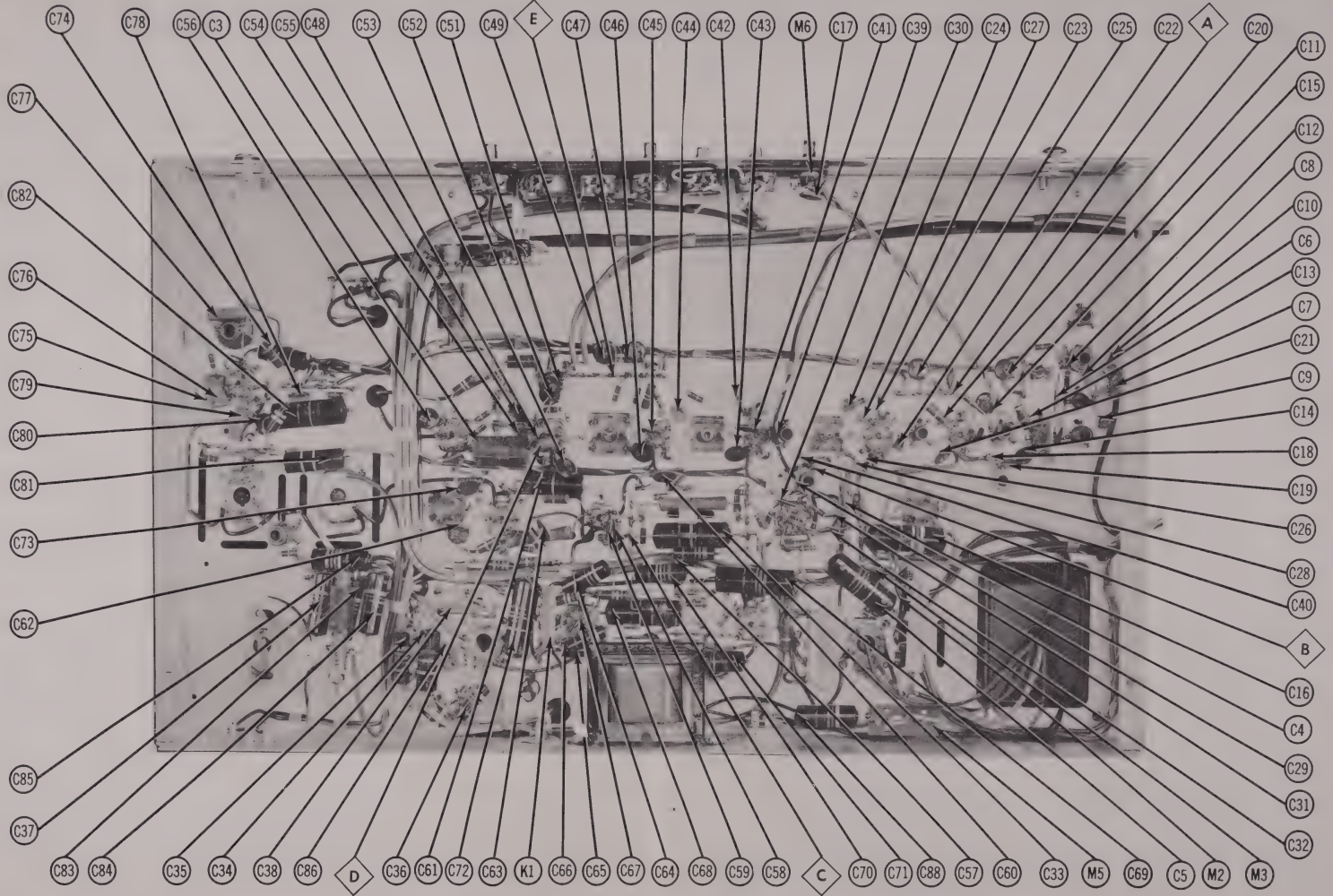
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 980001 - BOTTOM VIEW

SET 534 FOLDER 1



TV CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



TV CHASSIS BOTTOM VIEW - CAPACITOR, MISC., ALIGN. IDENT.

REMOTE CONTROL ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: A14 ..... GENERAL CEMENT #9440
A15, A16 ..... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537, 2538
A17, A18, A19 .... GENERAL CEMENT #8283, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

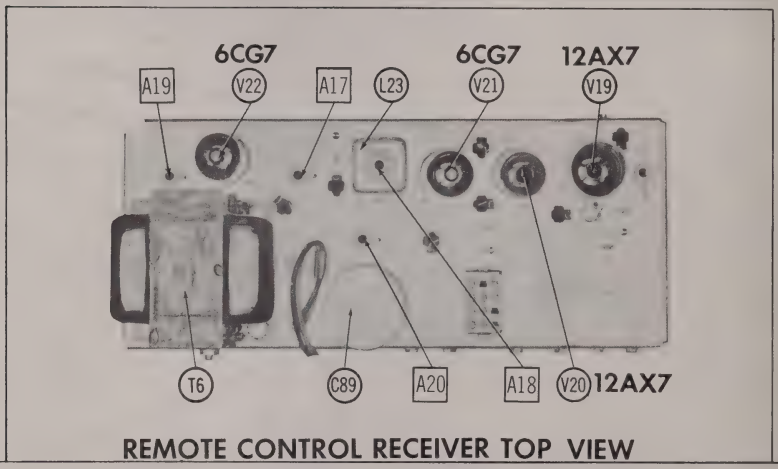
A transmitter known to be operating on the proper frequency may be substituted for the signal generator.

REMOTE CONTROL TRANSMITTER ALIGNMENT

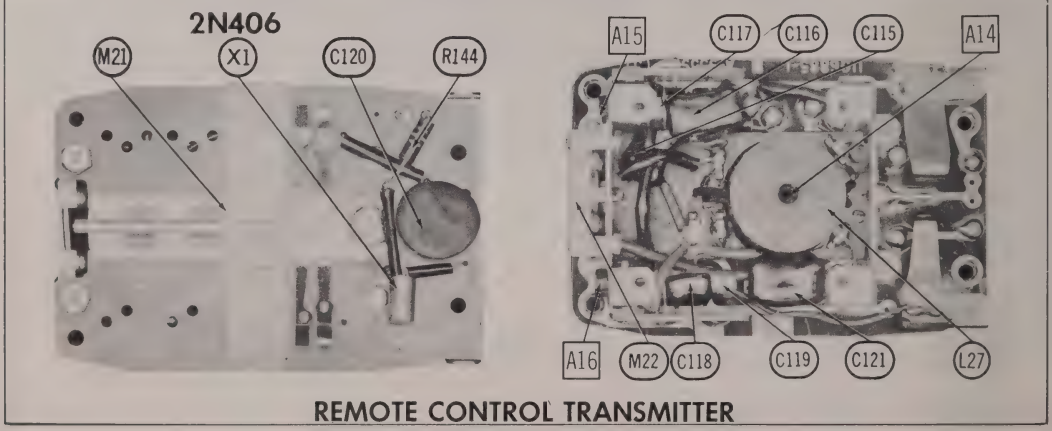
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT SCOPE	ADJUST	REMARKS
1.	High side to Horizontal Input of Scope. Low side to low side of scope.	19.125KC	Vert. Amp. probe approximately one inch in front of the transducer. Low side of scope to negative terminal of the transmitter battery.	A14	Depress "Off-Volume Down" button and adjust A14 for zero beat on scope.
2.	"	20.375KC	"	A15	Depress "Channel" button and adjust A15 for zero beat on scope.
3.	"	21.625KC	"	A16	Depress "On-Volume Up" button and adjust A16 for zero beat on scope.

REMOTE CONTROL RECEIVER ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru 100K to to transducer jack. Low side to chassis.	40.75KC	DC probe thru 10meg to point Ⓖ. Common to chassis.	A17, A18	Adjust for maximum deflection.
5.	"	43.25KC	DC probe thru 10meg to point Ⓡ. Common to chassis.	A19	"
6.	"	38.25KC	DC probe thru 10meg to point Ⓨ. Common to chassis.	A20	"



REMOTE CONTROL RECEIVER TOP VIEW



REMOTE CONTROL TRANSMITTER

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	• GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE	ITEM No.	USE	TYPE
V19	1st - 2nd 40KC Amp.	12AX7	V22	Channel Selector -	
V20	3rd - 4th 40KC Amp.	12AX7		On-Volume Up	
V21	40KC Driver - Off-Volume			Relay Control Amp.	6CG7
	Down Relay Control Amp.	6CG7			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C89A	±10	200		AFH3-84-15				TVLS-3466.5 *	
B	±5	200							
C	±500	50							
C90	40	50NP		PR87450	BR4015	TC492 †		†TVANS-1440 *	

† Use two units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C81	.1	200V	10%		VP4C2P1-10%	PM2P1	2DP-3-104	2DP-3-104	GEM-301	ZTM-P10
C82	330				BPD-00033	DD-331	CCD-331	CCD-331	B-333	10TS-T33
C83	120				DI-120	DD-121	CCD-121	GP3I2	B-110	10TS-T12
C84	10000				BPD-01	BYA10S1	CCD-103	B-110	B-110	5HK-S10
C86	120				DI-120	DD-121	CCD-121	GP3I2	B-110	10TS-T12
C86	10000				BPD-01	BYA10S1	CCD-103	B-110	B-110	5HK-S10
C87	120				DI-120	DD-121	CCD-121	GP3I2	B-110	10TS-T12
C88	120				DI-120	DD-121	CCD-121	GP3I2	B-110	10TS-T12
C89	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-301	ZTM-P10
C100	180	MMICA								
C101	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C102	680		10%		1469-00068		5HST68	CM-19B-68-K	MCJ244	MS-368
C103	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C104	.047	200V			P288N-047	DD-503	CUB2347	4DP-3-473	GEM-4147	ZTM-S47
C105	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C106	680		10%		1469-00068		5HST68	CM-19B-68-K	MCJ244	MS-368
C107	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C108	.047	200V			P288N-047	DD-503	CUB2347	4DP-3-473	GEM-4147	ZTM-S47
C109	680		10%		1469-00068		5HST68	CM-19B-68-K	MCJ244	MS-368
C110	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-301	ZTM-P10
C111	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C113	.047	200V			P288N-047	DD-503	CUB2347	4DP-3-473	GEM-4147	ZTM-S47
C113	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C114	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R107	100K			
R108	100K			
R109	100K			
R110	100K			
R111	150K			
R112	100K			
R113	100K			
R114	100K			
R115	100K			
R116	100K			
R117	100K			
R118	100K			
R119	680Ω			
R120	2.2meg			
R121	470K			
R122	2.2meg			
R123	1meg			
R124	10meg			
R125	15K 2W			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R126	2.2meg			
R127	1meg			
R128	10meg			
R129	1000Ω			
R130	2.2meg			
R131	1meg			
R132	10meg			
R133	12K 3W	PW3-12K	3G-12K	
R134	15Ω			
R135	10Ω			
R136	10Ω			
R137	4.7Ω 5W	PW5-4.7	5W-SQ-4.7	
R138	4.7Ω 5W	PW5-4.7	5W-SQ-4.7	
R139	15K			
R140	4.7Ω 5W	PW5-4.7	5W-SQ-4.7	
R141	15Ω			
R142	1meg			
R143	1meg			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA FLEETWOOD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L23	40KC Trans.						
L24	40.75KC						
L25	43.25KC						
L26	38.25KC						

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA FLEETWOOD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	117V @ .38A	130V @ .025A DC	28V ② 7A AC Tap ⑥ 6.7A ① 1.8A						

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA FLEETWOOD PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M10	.035A		1N1763	40H	SIR500	Silicon Type
M11	.200A					Selenium Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA FLEETWOOD PART No. FUSE	FLEETWOOD PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
MS2	1½"	length #26	wire					

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA FLEETWOOD PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M13	*					* Selenium Diode
M14	*					
M15	*					

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M16	Relay		Channel Up
M17	Relay		Volume Up
M18	Relay		Volume Down
M19	Transducer	864001	

REMOTE CONTROL TRANSMITTER PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	2N408	Osc.	2N406	2N362	2N406	PNP

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C115	180	2%					CM-15-E-181G		
C116	100	2%			TCZ-100		CM-15-E-101G	MCE235	
C117	6-21								
C118	39	2%					CM-15-E-390G		
C119	6-25								
C120	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C121	270	2%					CM-15-E-271G		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA FLEETWOOD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L37	Osc.						

BATTERIES

ITEM No.	VOLTAGE	REPLACEMENT DATA FLEETWOOD PART No.	BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M20	4.2V				E163		TR163		

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M21	Switch Assy.		Includes Off-Vol. Up, Vol. Down, Channel Selector
M22	Microphone		

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	• GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6CM6	V10	Sync Phase Inv. -	
V2	2nd Video IF Amp.	6CM6		Horiz. AFC	6BJ8
V3	3rd Video IF Amp. -		V11	Vert. Mult.	6CG7
	Video Detector	6AM8A (8AM8) *	V12	Vert. Output	6DT5
V4	Video Output - AGC Keying	6EB8	V13	Horiz. Mult.	6CG7
V5	1st Sound IF Amp.	6AU6	V14	Horiz. Output	6DQ6A
V6	2nd Sound IF Amp.	6AU6	V15	Damper	6DE4
V7	Ratio Det. - AF Amp.	6BN8	V16	HV Rectifier	1B3GT
V8	Audio Output	EL84	V17	LV Rectifier	5V3
V9	Sync Sep. - Noise Limiter	6BY6			

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA FLEETWOOD PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V18	23AVP4		23AVP4 ①		23AVP4 ②	① Aluminized
	23CP4	23CP4 ①	23CP4 ①		23CP4 ②	② Silver Screen "86"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	±80	400	T20001	AFH4-58-75	CGS70	FP42D.46	TMQ-4480	TVLS-4557.8 *	
B	±40	350			*BR3035				
C	±20	300							
D	20	300							
C2A	±100	350	T20002	AFH4-05-80	D0048	FP43.6	TMQ-4397	TVLS-4535.10*	
B	±40	350							
C	±10	350							
D	10	350							
C3	5	50		PR8310	BBR5-50	TC30	TD-5-50	TVA-1303	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C5	.022	400V			P488N-022	DD-203	CUB4S22	4DP-3-223	GEM-4122	4TM-S22
C6	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C7	82	NPO	5%			DTZ-82	C10Q82C	CCTO-820	CNO-482	10TCC-Q82
C8	13	NPO	5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C9	10	NPO	5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C10	12	NPO	5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C11	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C12	56		5%			TCZ-56	C10Q56C	CCTO-560	CNO-456	10TCC-Q56
C13	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C14	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C15	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C16	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-3047	ZTM-P47
C17	27		10%		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C18	2.2		10%		NPO-SI 2.2	DTZ-2R2	C10Y22C	CCTO-2R2	CNO-522	10TCC-Y22
C19	22	NPO	5%			DTZ-22	C10Q22C	CM-19B-220J	CNO-422	10TCC-Q22
C20	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C21	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C22	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C23	470		10%		DI-470	DD-471	5HST47	CCD-471	GP347	10TS-T47
C24	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C25	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C26	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C27	3.3	NPO	5%		NPO-DI 3.3	DTZ-3R3	C10Y33C	CCTO-3R3	CNO-533	10TCC-Y33
C28	2.2		10%		NPO-SI 2.2	TCZ-2R2	C10Y22C	CCTO-2R2	CNO-522	10TCC-Y22
C29	82	NPO	5%			DTZ-82	C10Q82C	CM-19B-820J	CNO-482	10TCC-Q82
C30	220		10%			DD-221	L10T22	CCD-221	GP323	10TS-T22
C31	1200				DI-1200	DD-121	DP4B6D12	CCD-121	GP312	10TS-T12
C32	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-472	5HK-D47
C33	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C34	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C35	.0068	600V			P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C36	.0047	400V			P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C37	.047	600V			P688N-047	DD-503	CUB6347	6DP-3-473	GEM-6147	6TM-S47
C38	91	2500V	5%	#VSCM.20C91GJ						
C39	47	NPO	10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C40	2.2		10%		NPO-SI 2.2	TCZ-2R2	C10Y22C	CCTO-2R2	CNO-522	10TCC-Y22
C41	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	100				BPD-0001	DD-101	L10T1	CCD-101	B-310	10TS-T10
C45	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C47	470		10%		DI-470	DD-471	5HST47	CCD-471	GP347	10TS-T47
C48	1000				BPD-001	DD-102	BYA10X	CCD-102	B-210	5HK-D10
C49	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	820		10%		DI-820	DD-821	5HST82	CCD-821	GP382	10TS-T82
C53	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	470				BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C55	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C57	.0022	500V			P588N-0022	D5-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22

SET 534 FOLDER 1

FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)

FOLDER 1

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C58	220	10%		DI-220	DD-22	L10T22	CCD-22	GP322	10TS-T22
C59	47			DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C60	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HE-S10
C61	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C62	1000	10%		DE-1000	DD-102	BR5I1	CCD-102	GP310	10TS-D10
C63	1000	10%		DE-1000	DD-102	BR5I1	CCD-102	GP310	10TS-D10
C64	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C65	.0082	600V 10%		P984C82-008J		DPM8D82	6DP-1-823	GEM-16382	6PS-D82
C66	.0047	600V 10%		V84C82A7-10%		PM8D47	6DP-1-473	GEM-16347	6TM-D47
C67	220	10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C68	.1	600V		P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C69	.068	600V		P488N-068		CUB6S68	6DP-4-683	GEM-6168	6TM-S68
C70	.033	600V 10%		V84C8S22-10%		PM6S33	6DP-3-333	GEM-1613	6TM-S33
C71	.01	1600V 10%				DPM8S5	16DP-3-103	GEM-1611	MS-S1
C72	.33	400V		P488N-33		CUB4P33	4DP-5-224	GEM-4032	4TM-P32
C73	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-347	5HE-D47
C74	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C75	100	10%		1469-0001	TCZ-100	22S5T1	CM-19B-101K	MCB235	MS-31
C76	470	10%		1458-00068		5S5T47	CM-19B-471K	MCJ244	MS-347
C77	3900	10%		1454-0039		1R5D39	CM-20B-392K	MCJ462.5	MS-239
C78	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-347	5HE-D47
C79	330	10%		1469-00033		5S5T33	CM-19B-331K	MCB241	MS-333
C80	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HE-D10
C81	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C82	.1	600V		P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C83	.047	600V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C84	.047	600V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C85	.033	600V 10%		V84C8S33-10%		PM6S33	6DP-3-333	GEM-1613	6TM-S33
C86	27	4000V NT50 10%	#VDM42C270J						
C87	100	3000V 5%							
C88	.047	600V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

Fleetwood Part Number.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FLEETWOOD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	928009					Volume
B	200K Tap							
	Switch							Power Off-On
R2A	300Ω	½	928008	B-2	A47-500-S	B11-102		Contrast
B	Shaft			Not Req.	FS-3	S10		
R3A	500K	½	928007	B-59	A47-500K-S	Q11-135	U50	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	25K	½	928003	B-26	A47-25K-S	Q11-120	U29	Horiz. Hold
B	Shaft			Not Req.	KSR-3	Not Req.	Not Req.	
R5A	4meg	½	928010	B-98	A47-4meg-S	B11-240	U67	Sync Noise Control
B	Shaft			Not Req.	FS-1	S55	Not Req.	
R6A	4meg	½	928005	AB-98	A47-4meg-S	B11-240	SU-67	Focus
B	Shaft			AK-1	FKS1-4	S53	Not Req.	
R7A	100K	½	928006	AB-40	A47-100K-S	B11-128	SU-41	Area (AGC)
B	Shaft			AK-1	FKS1-4	S53	Not Req.	
R8A	1.5meg	½	928002	B-742	A47-1.5meg-S	Q11-138	U155	Vert. Hold
B	Shaft			Not Req.	KSR-3	Not Req.	Not Req.	
R9A	1meg	½	928001	AB-69	A47-1meg-S	B11-137	SU-54	Vert. Linearity
B	Shaft			AK-1	FKS1-4	S53	Not Req.	
R10A	1meg	½	928001	AB-69	A47-1meg-S	B11-137	SU-54	Height
B	Shaft			AK-1	FKS1-4	S53	Not Req.	
R11A	10K	½	928004	AB-14	A47-10K-S	B11-116	SU-20	Horiz. Drive
B	Shaft			AK-1	FKS1-4	S53	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R12	47K			
R13	8.2meg			
R14	4300Ω			
R15	1000Ω			
R16	4700Ω 1W			
R17	2200Ω 1W			
R18	47K			
R19	1000Ω			
R20	4700Ω 1W			
R21	62Ω			
R22	10K			
R23	1000Ω			
R24	22K			
R25	150Ω			
R26	47K			
R27	4700Ω			
R28	22K			
R29	4000Ω 4W	PW5-4000	5W-SQ-4000	
R30	930Ω 1W			
R31	22K			
R32	270Ω			
R33	330K			
R34	470K			
R35	100K			
R36	100K			
R37	470K			
R38	470K			
R39	15K			
R40	1000Ω			
R41	330Ω			
R42	10K			
R43	15K 1W			
R44	22K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R45	220Ω			
R46	47K			
R47	6800Ω			
R48	47K			
R49	4.7meg			
R50	330K			
R51	2200Ω			
R52	10000Ω			
R53	680K			
R54	1800Ω 2W			
R55	15K 1W			
R56	100Ω			
R57	100Ω			
R58	2.2meg			
R59	330K			
R60	470K			
R61	150K			
R62	8200Ω 1W			
R63	22K 4W	PW5-22K	5W-SQ-22K	
R64	2200Ω 1W			
R65	2200Ω 1W			
R66	2200Ω 1W			
R67	1800Ω 1W			
R68	390Ω			
R69	68K 1W			
R70	1000Ω			
R71	680K 1W			
R72	1.2meg			
R73	27K 1W			
R74	47K 1W			
R75	22K			
R76	100Ω			
R77	2200Ω			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R78	10K			
R79	82K			
R80	330K			
R81	220Ω			
R82	220Ω			
R83	3Ω (Cold)			
R84	100K			
R85	100K			
R86	470K			
R87	6800Ω			
R88	1500Ω			
R89	100K			
R90	1000Ω 1W			
R91	100K			
R92	820Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R93	470K			
R94	100Ω			
R95	100Ω			
R96	10K 2W			
R97	1000Ω			
R98	1200Ω			
R99	6.5Ω			
R100	4700Ω			
R101	2000Ω 10W	PW10-2000	10W-SQ-2000	
R102	1meg			
R103	1.5meg			
R104	10Ω 10W	PW10-10	10W-SQ-10	
R105	220K			
R108	62Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FLEETWOOD PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 10000mmf, 82000, 82000, 225, 22K		Aerovox PA-111 Centralab PC-101 Sprague V-2

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	39.75MC Trap	780001	TV-152	6236	RTC-8626	T26	
L2	41.25MC Trap	780001	TV-152	6236	RTC-8626	T26	
L3	47.25MC Trap	780003	TV-153	6235	RTC-8556	T26	
L4	1st Video IF	780001	TV-131	6236	RTC-8626	T26	
L5	47.25MC Trap	780004	TV-153	6235	RTC-8556	T26	
L6	2nd Video IF	780002					
L7	3rd Video IF	780003	TV-130	6219	RTC-8551	T27	
L8	4th Video IF	758001	TV-128	6234	RTC-8563	T21	
L9	RF Choke (7uh)	790001	RC-566	4610	RTC-8530	T359	
L10	Peaking (97uh)	770001	TV-181	6177	RTC-8594	T304	
L11	4.5MC Trap	780005	TV-151	1470	RTC-8603	T250	
L12	Peaking (33Suh)	770003	TV-200	6132	RTC-8577	T319	
L13	Peaking (375uh)	770002	TV-198	6130	RTC-8576	T316	
L14	Peaking (33Suh)	770003	TV-200	6132	RTC-8577	T319	
L15	1st Sound IF	771001	TV-119	1469	RTC-8602	T249	
L16	2nd Sound IF	772001	TV-154	1470-A	RTC-8604	T247	
L17	Ratio Detector	774001	TV-110	1468	RTC-8601	T246	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L18	Horiz. Stabilizer (Freq.)	781001	TV-163	6210	RC110	RTC-8622	HS-5	WLC-25	T103
L19	Width Coil Prt. 4.7MH-29.5MH Sec. .03MH	778001							
L20	Horiz. AFC Coil	783001						WLC-10 ①	
L21	Horiz. Linearity	784001	MWC-6	6322	QRC103 ②	WC-8A	WC-22	WLC-5	T107

① Adjust for 15V PP at AFC Diode.

② Drill new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L22	.320A	25Ω	.9 Hy.	784001				C-29X	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ② 2A	560VCT ③ .320A DC	5V ④ 3.8A	975001					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ④ .75A	6.3V ③ 10A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	977001		PCM-2017 ①②	DY-27A ②	Y-48 ③	A-112X Y-80-1 ②③	
T3	Yoke (Horiz. 18MH) (100) (Vert. 13MH)	994001 †						
	Rear Cover and Centering Device	793001						
T4	Horiz. Output	782001						

† Includes cable and plug.
① Use original rear cover and centering device. Remove horizontal damping network; use original.
② Connect same as original.
③ Remove 470Ω ½ watt resistors across vertical windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: FLEETWOOD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	5600Ω	16Ω Tap ② 3-4Ω	965001			24S92	S-29X	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: FLEETWOOD PART No. FUSE	FLEETWOOD PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	N	3/10A 250V S/B			333.300 (N 3/10A 250V S/B)	346008	N 3/10	HN0 to 3/10
M2	1" length #26 wire							

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: FLEETWOOD PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N87A			1N87A	1N87A	AGC Clamper, Pigtail

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M4	Tuner	980001	VHF
M5	Circuit Breaker	740001	
M6	Switch	952001	Definition (Rotary Type)
M7	Switch	499001	Programmer
M8	Switch		TV Off-On (Actuated by Volume Control)
M9	Motor	125001	

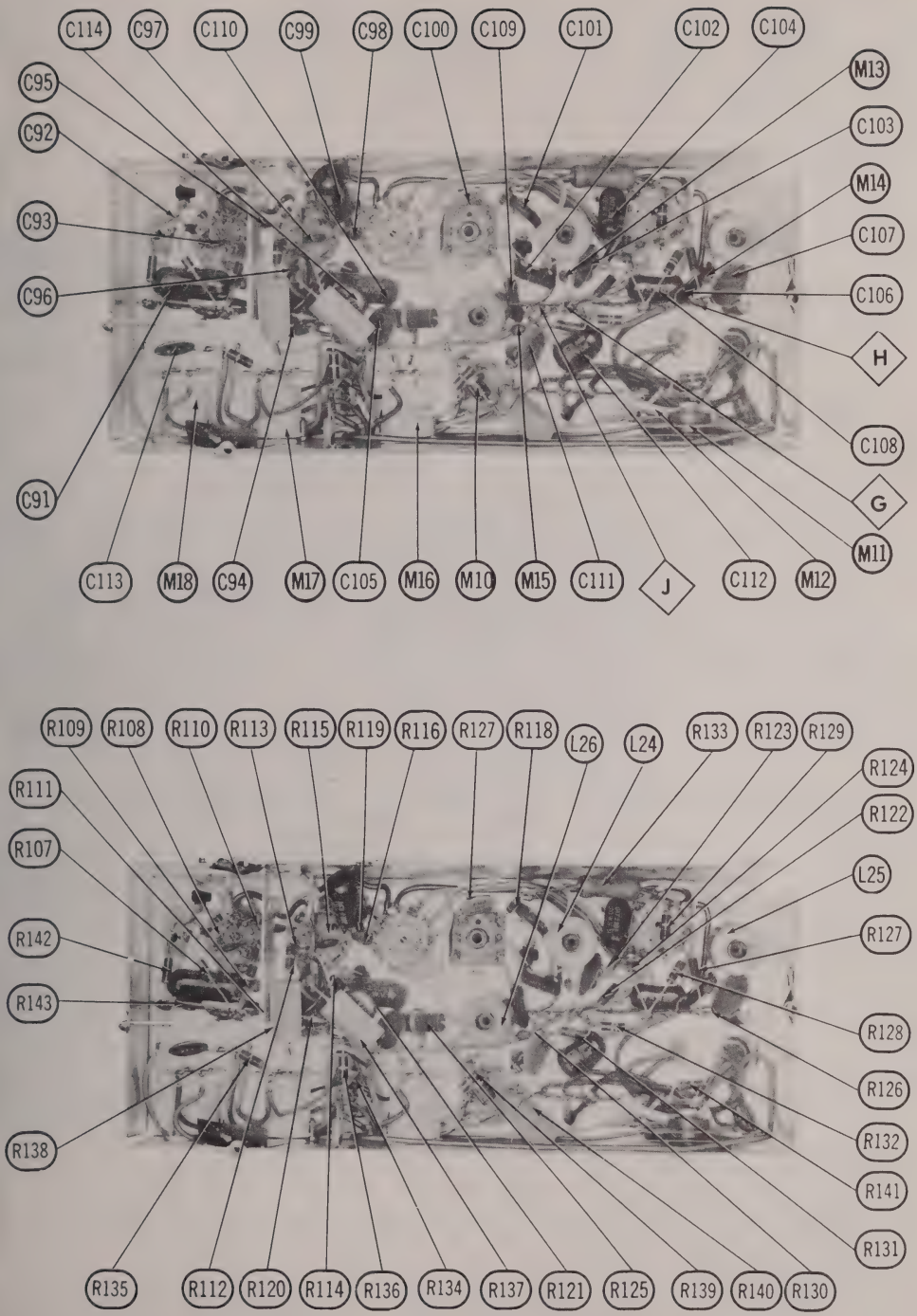
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	390001	Model 1001
Mask	390002	Model 1011
Knob	362001	Channel Selector
Knob	365001	Fine Tuning
Knob	361001	Volume, Brightness, Contrast
Knob	361002	Definition, Vertical Hold, Noise Control

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 6 Conductor



REMOTE CONTROL RECEIVER - BOTTOM VIEW

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON ••		• SYLVANIA •
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6ER5/GG	V202	Mixer - Osc.	6CG8A (6CG8) *

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

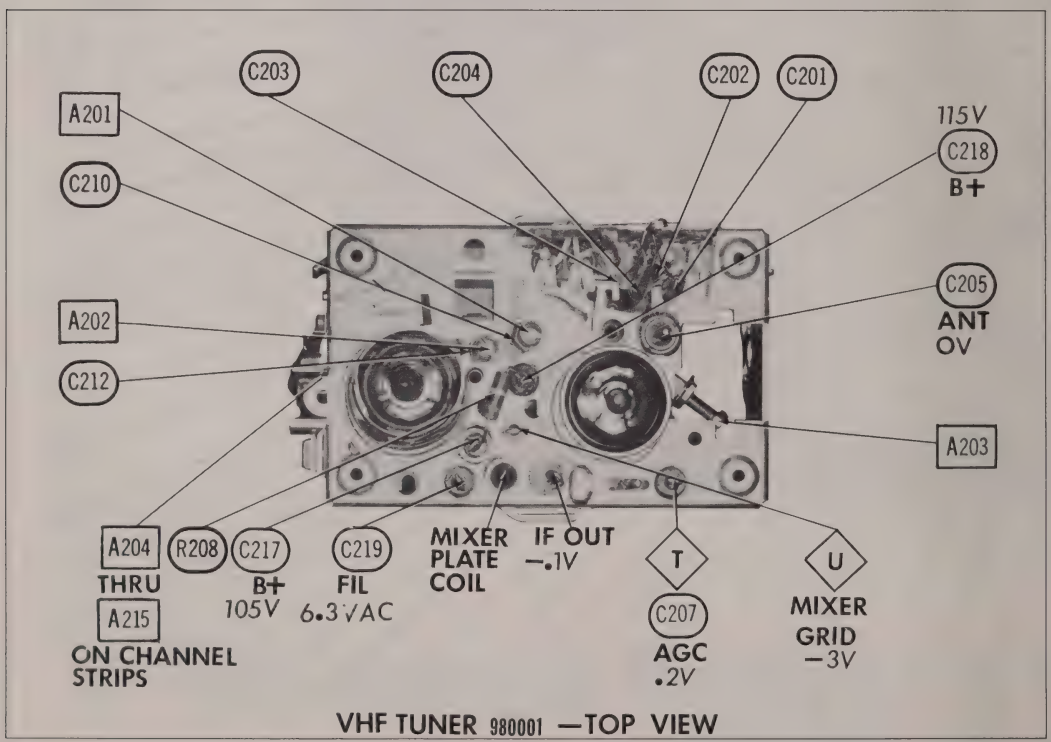
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30							
C206	28		N750-DI 25	TCN-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7			829-7				
C209	100		EF-0001	MFT-100				
C210	.5-3			829-3		CV-1	CT565	
C211	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C212	.5-3			829-3		CV-1	CT565	
C213	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C214	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C215	7.25							
C216	18 N220					*		10TCR-Q18
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1000Ω				R206	4700Ω			
R203	2700Ω				R207	4700Ω			
R204	220K				R208	1800Ω			



VHF TUNER 980001 —TOP VIEW

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A201, A202 and A203.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A204 thru A215.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

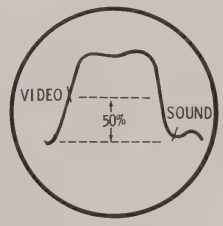


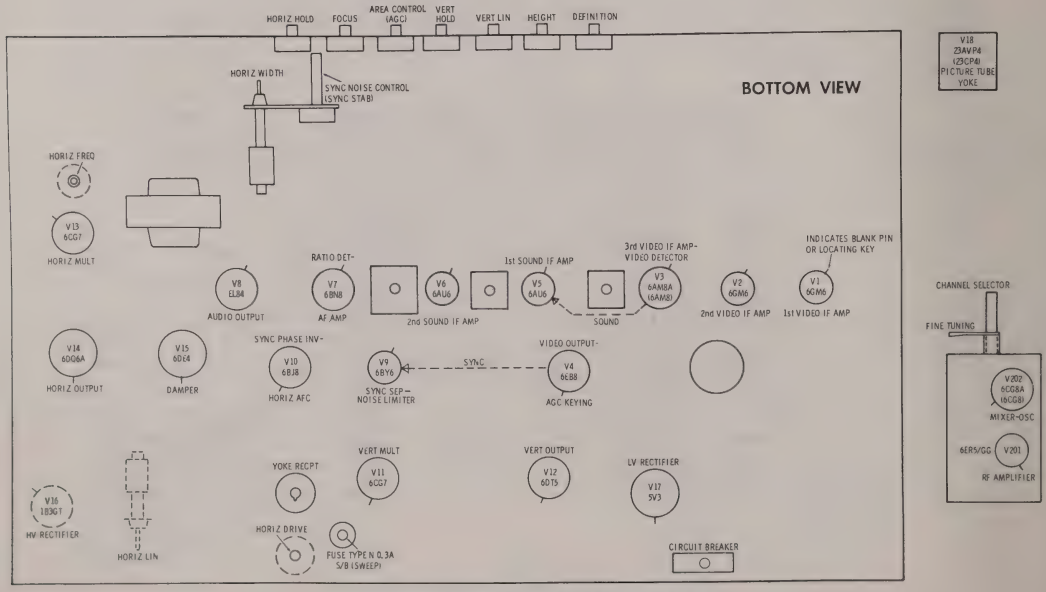
FIG. 202

RESISTANCE MEASUREMENTS

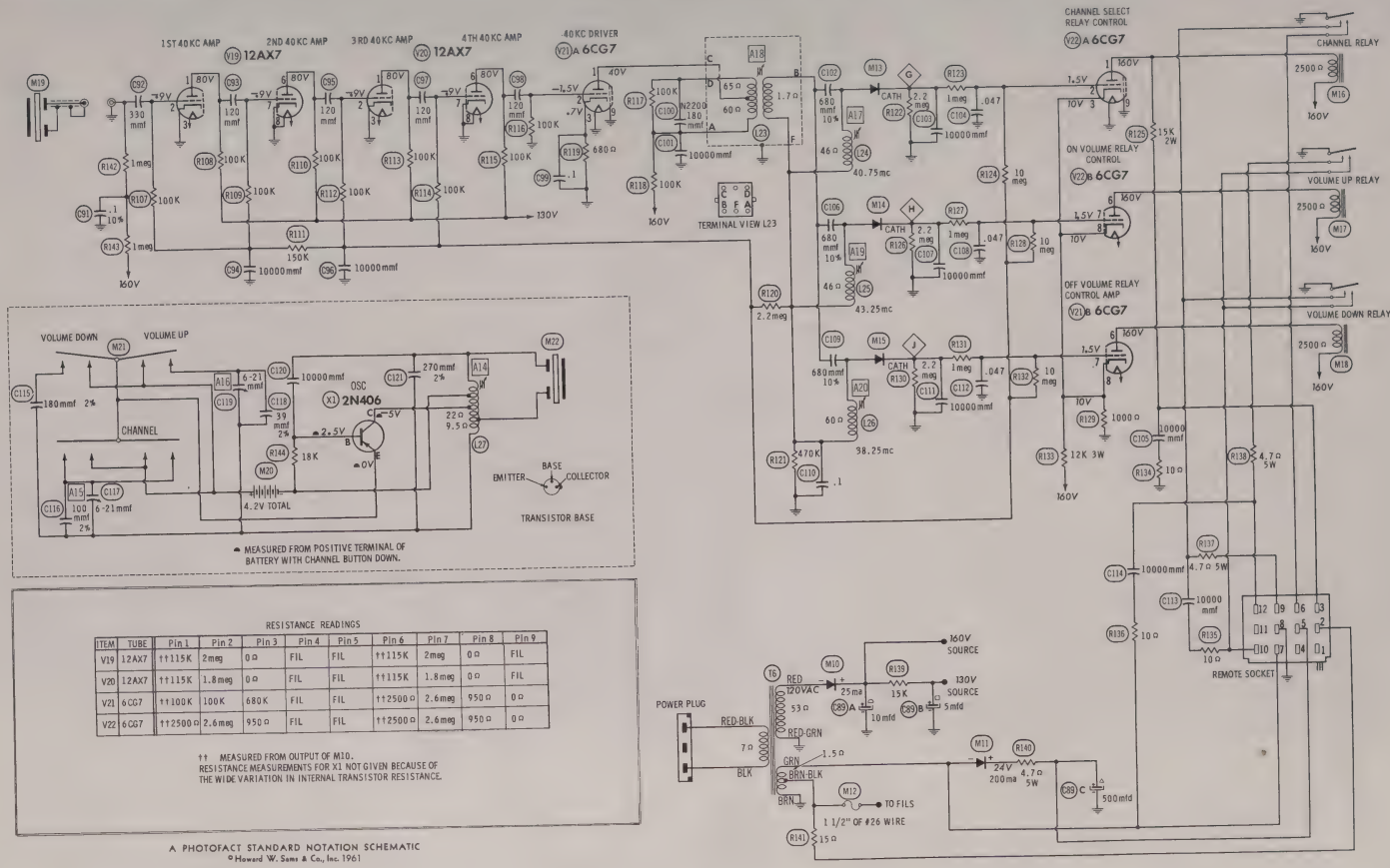
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6GM6	•45K	62Ω	FIL	FIL	†6900Ω	†6900Ω	0Ω		
V2	6GM6	•40K	62Ω	FIL	FIL	†6900Ω	†6900Ω	0Ω		
V3	6AM8A	150Ω	.1Ω	†24K	FIL	FIL	†1000Ω	.1Ω	4700Ω	0Ω
V4	6EB8	†25Ω	†845Ω	300K	FIL	FIL	•60Ω	4700Ω	†22K	†4800Ω
V5	6AU6	1.7Ω	0Ω	FIL	FIL	†3000Ω	†3000Ω	330Ω		
V6	6AU6	10K	0Ω	FIL	FIL	†10K	†10K	0Ω		
V7	6BN8	INF	0Ω	INF	FIL	FIL	6800Ω	†340K	4.7meg	2200Ω
V8	EL84	NC	680K	200Ω	FIL	FIL	NC	†2250Ω	NC	†17K
V9	6BY6	•300K	0Ω	FIL	FIL	†470K	†11K	2.5meg		
V10	6BJ8	8.3Ω	INF	8.3Ω	FIL	FIL	INF	†4400Ω	†470K	4400Ω
V11	6CG7	†68K	60K	1000Ω	FIL	FIL	†780K	•1.8meg	1000Ω	0Ω
V12	6DT5	†2200Ω	NC	•1.5meg	FIL	FIL	NC	0Ω	NC	†300Ω
V13	6CG7	†7800Ω	INF	1500Ω	FIL	FIL	†100K	•110K	1500Ω	0Ω
V14	6DQ6A	NC	FIL	NC	†10K	•1.1meg	TP	FIL	0Ω	TOP CAP †9Ω
V15	6DE4	NC	NC	4.1meg	NC	†35Ω	NC	FIL	FIL	
V16	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †265Ω
V17	5V3	NC	¶20K	NC	24Ω	NC	25Ω	NC	¶20K	
V18	23AVP4	FIL	•300K	†200K	•†1meg	NC	NC	200K	FIL	
V201	6ER5/GG	0Ω	330K	FIL	FIL	†5200Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†11K	0Ω	FIL	FIL	†5200Ω	†6000Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 2 OF V17.
† MEASURED FROM PIN 3 OF V15.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V19	12AX7	††115K	2meg	0Ω	FIL	FIL	††115K	2meg	0Ω	FIL
V20	12AX7	††115K	1.8meg	0Ω	FIL	FIL	††115K	1.8meg	0Ω	FIL
V21	6CG7	††100K	100K	680K	FIL	FIL	††2500Ω	2.6meg	950Ω	0Ω
V22	6CG7	††2500Ω	2.6meg	950Ω	FIL	FIL	††2500Ω	2.6meg	950Ω	0Ω

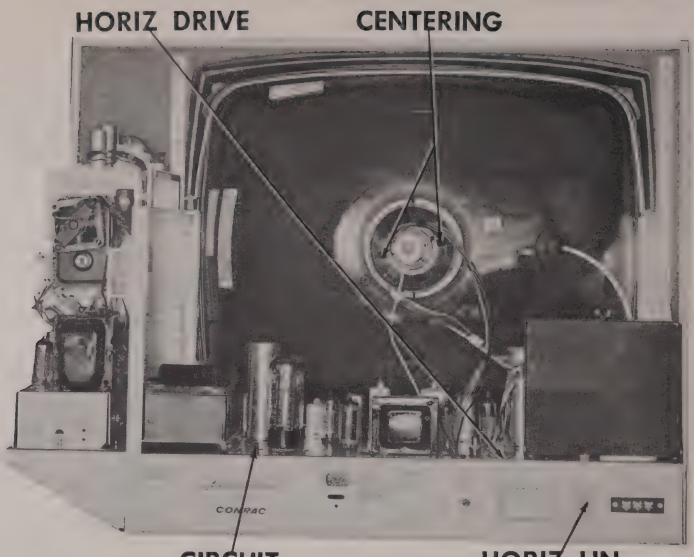
†† MEASURED FROM OUTPUT OF M10.
RESISTANCE MEASUREMENTS FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1961

REMOTE CONTROL RECEIVER & TRANSMITTER

FLEETWOOD MODELS 1001, 1011 (Ch. 1000, 1010)



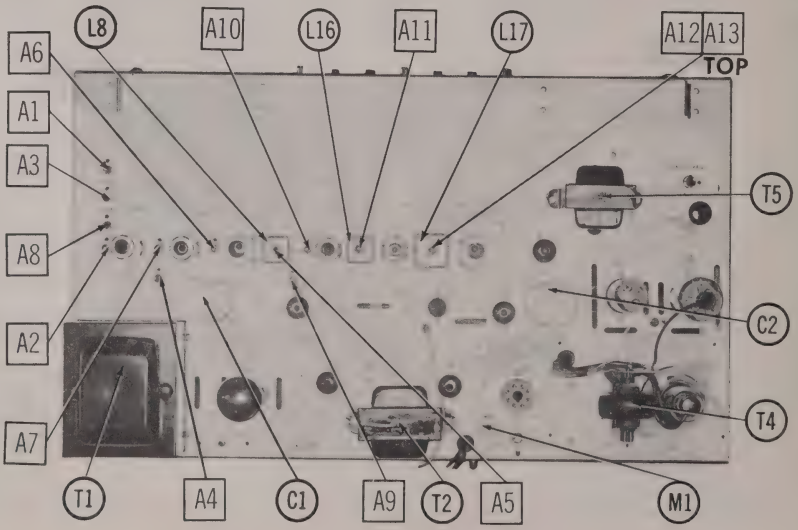
CHASSIS – REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a clip lead from pin 2 (grid) of the Horizontal Multivibrator to chassis. Set the Horizontal Hold to the center of its range and adjust the Horizontal Frequency Slug (B1) until the picture is almost synchronized horizontally. Remove the clip lead.

The Horizontal Drive Control will expand or compress the left side of the picture. The Horizontal Linearity Slug (B2) will expand or compress the right side of the picture. Adjust the Horizontal Drive and the Horizontal Linearity for best linearity across the entire picture. It may be necessary to readjust the Height, Vertical Linearity and the Horizontal Frequency after this adjustment.

Adjust the Width Slug (B3) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.



TV CHASSIS – TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

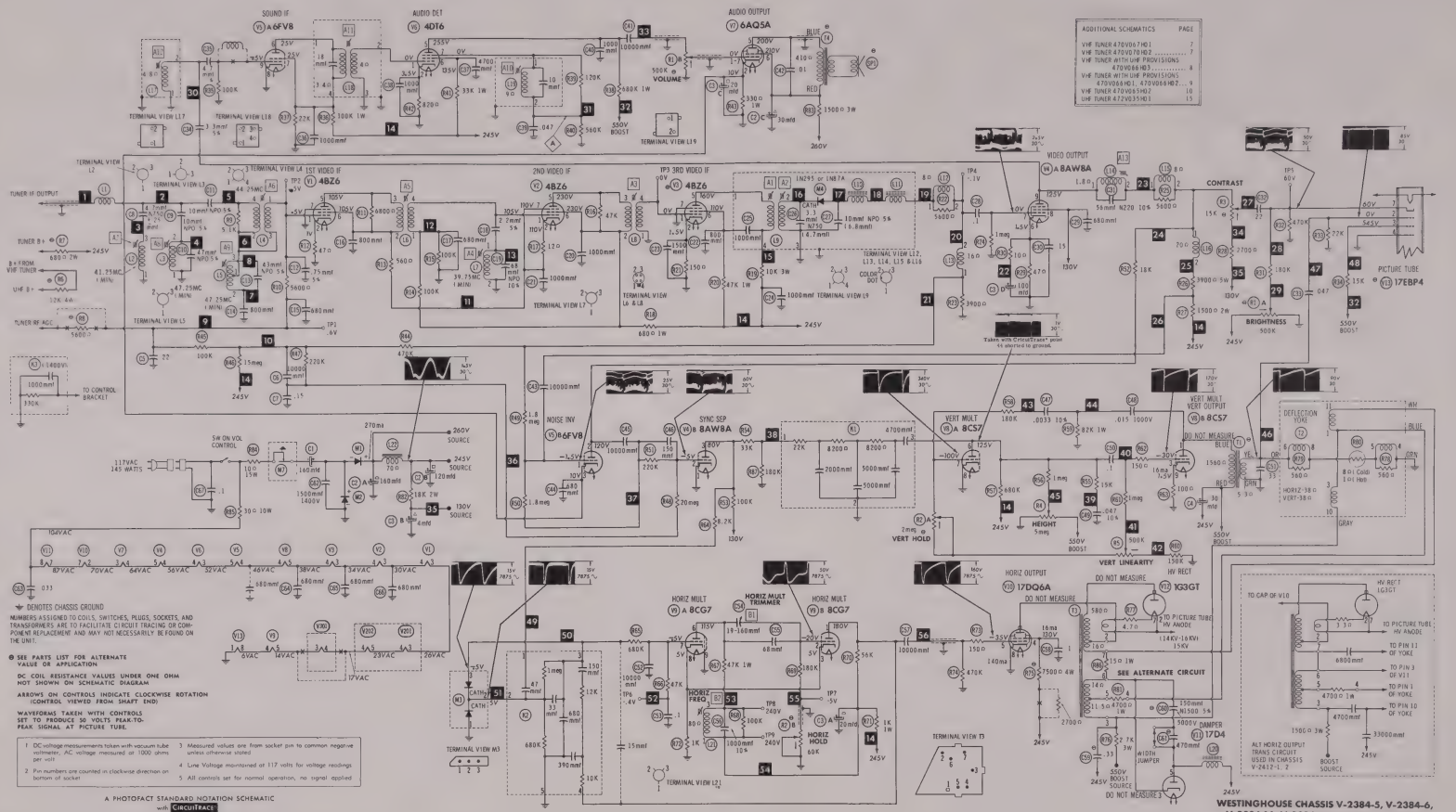
MODEL H-P3150U (CH. V-2384-15)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

DATE 6-61 SET 534 FOLDER 2

SET 534 FOLDER 2

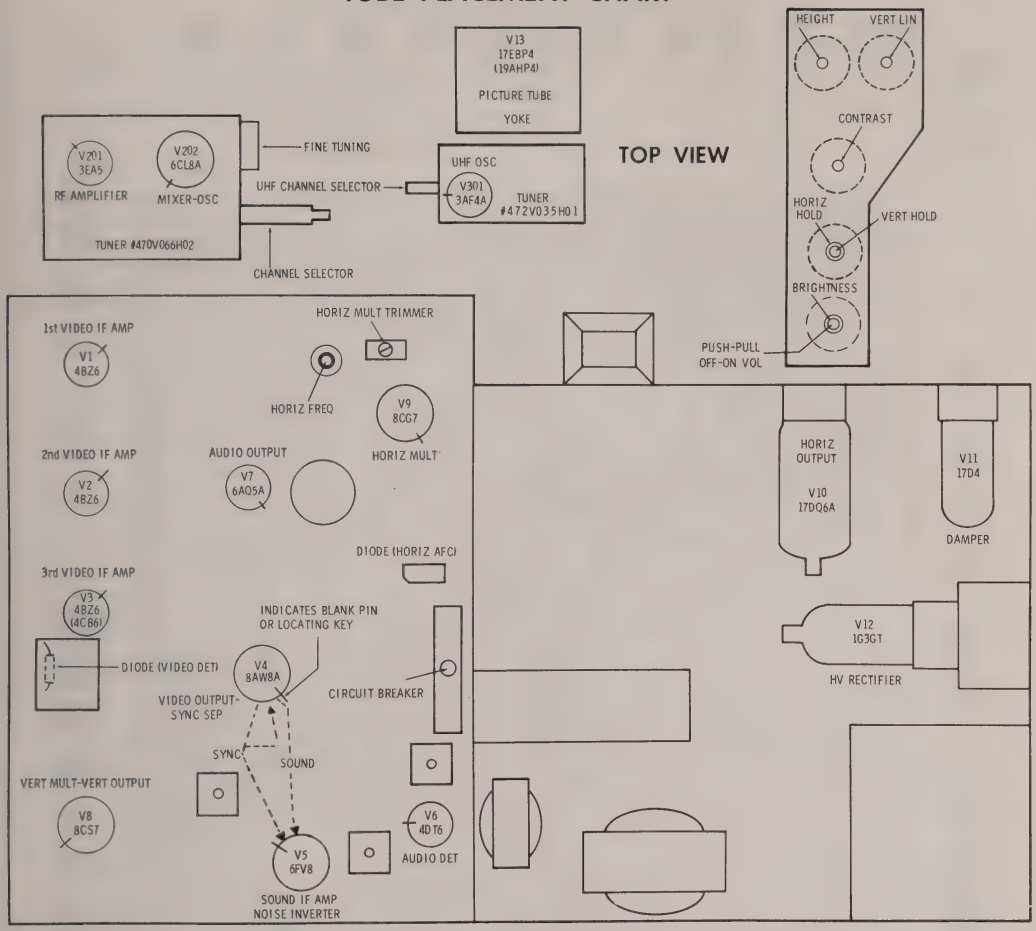

ADDITIONAL SCHEMATICS PAGE
VHF TUNER 470VD67HD1 7
VHF TUNER 470VD70HD2 7
VHF TUNER WITH UHF PROVISIONS 470VD66HD3 8
VHF TUNER WITH UHF PROVISIONS 470VD66HD1, 470VD66HD2 9
VHF TUNER 470VD65HD2 10
UHF TUNER 472VD35HD1 15
SOUND IF V5 A 6FV8
AUDIO DET V6 4DT6
AUDIO OUTPUT V7 6AQ5A
1ST VIDEO IF V1 4BZ6
2ND VIDEO IF V2 4BZ6
3RD VIDEO IF V3 4BZ6
VIDEO OUTPUT V4 A 8AW8A
NOISE INV V6 B 6FV8
SYNC SEP V8 B 8AW8A
VERT MULT V8 A 8CS7
VERT MULT V8 B 8CS7
HORIZ MULT V9 A 8CG7
HORIZ MULT V9 B 8CG7
HORIZ OUTPUT V10 17DQ6A
HV RECT V12 1G3GT
PICTURE TUBE V13 17EBP4
VOLUME
CONTRAST
BRIGHTNESS
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ HOLD
HORIZ FREQ
HORIZ MULT TRIMMER
WIDTH JUMPER
DO NOT MEASURE
SEE ALTERNATE CIRCUIT
TERMINAL VIEW L17
TERMINAL VIEW L18
TERMINAL VIEW L2
TERMINAL VIEW L3
TERMINAL VIEW L5
TERMINAL VIEW L7
TERMINAL VIEW L9
TERMINAL VIEW L12, L13, L14, L15 & L16
TERMINAL VIEW L6 & L8
TERMINAL VIEW L19
TERMINAL VIEW M3
TERMINAL VIEW T3
TERMINAL VIEW T2
TUNER IF OUTPUT
TUNER B+
B+ FROM VHF TUNER
UHF B+
TUNER RF AGC
TO CONTROL BRACKET
SW ON VOL CONTROL
117VAC 145 WATTS
260V SOURCE
245V SOURCE
130V SOURCE
TO CRT CAP OF V10
TO PICTURE TUBE HV ANODE
TO PIN 11 OF YOKE
TO PIN 3 OF V11
TO PIN 1 OF YOKE
TO PIN 10 OF YOKE
ALT HORIZ OUTPUT TRANS CIRCUIT USED IN CHASSIS V-2412-1, 2
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1961

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

FOLDER 2

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

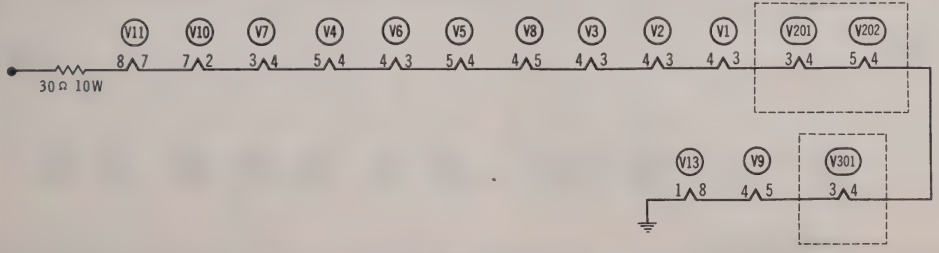
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V13
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rectifiers (B+)
Vert. off freq. V8
Horiz. off freq. Diodes (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V301, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V5, V4, V7
No horiz. sync V5, V4, V7
No vert. or horiz. sync V5, V4, V7

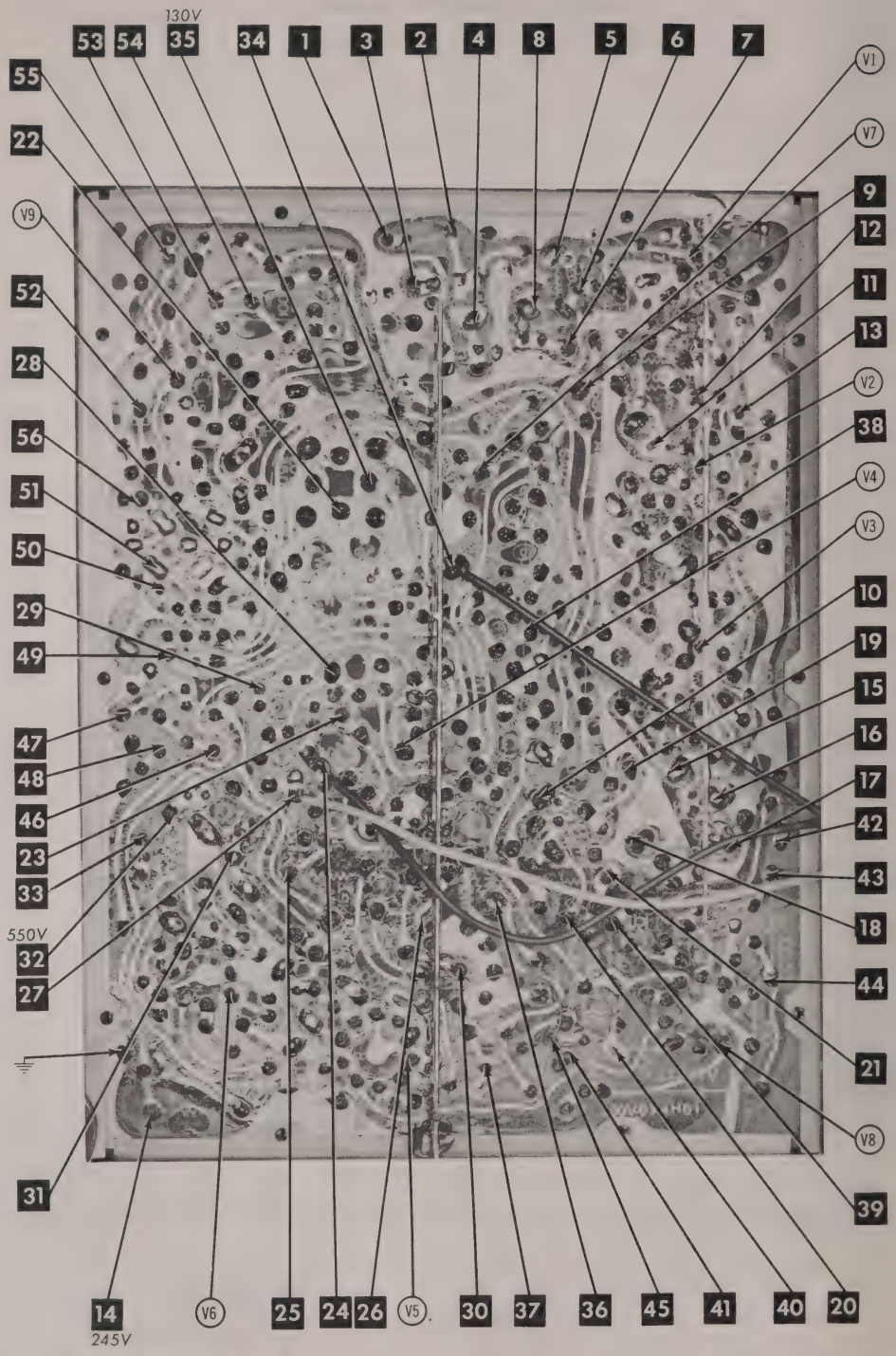
This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SET 534 FOLDER 2

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

FOLDER 2



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead to a 4 volt bias supply to point TP-1. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to TP-2. Low side to chassis.	Not Used	44.25MC (Unmod.)	10	Use VTVM DC probe to TP-4. Common to chassis. (Across Video Det. Load)	A1, A2	Adjust for maximum deflection.
2.	"	"	45.62MC	"	"	A3	"
3.	"	"	39.75MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	42.75MC	"	"	A5	Adjust for maximum deflection.
5.	"	44MC (10MC Swp.)	39.75MC 41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. to TP-4 Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1, A2, A3 and A5 for desired response.
6.	High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis.	Not Used	44.25MC	"	Use VTVM DC probe to TP-4. Common to chassis.	Mixer Plate Coil	Adjust for maximum deflection.
7.	"	"	44.0MC	"	"	A6	"
8.	"	"	41.25MC	"	"	A7	Adjust for MINIMUM deflection.
9.	"	"	47.25MC	"	"	A8	"
10.	"	"	"	"	"	A9	"
11.	"	44MC (10MC Swp.)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. to TP-4 Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch Mixer Plate Coil and A6 for desired response.

SOUND IF ALIGNMENT

Tune in a TV signal, preferably with a test pattern and tone signal. Adjust the Fine Tuning for best reception. Set the Volume Control so that the sound is audible. Adjust A10 for maximum sound output.
Connect a short clip lead from pin 1 (grid) of the 3rd Video IF Amp. to chassis. Connect the DC probe of the VTVM to point (A). Common to chassis. Adjust A11 for maximum negative voltage on the VTVM. Remove the clip lead from the circuit. Disconnect the antenna lead and place near the antenna terminals so that the signal coupled to the receiver produces a very weak picture. A hiss will be noted in the sound. Adjust A12 for maximum negative voltage on the VTVM. If the VTVM indicates a broad response while adjusting A12, move the antenna lead farther from the antenna terminals.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	High side thru .001mfd to TP-4. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	Demodulator probe thru .001mfd to TP-5. Common to chassis.	A13	Adjust for MINIMUM deflection.

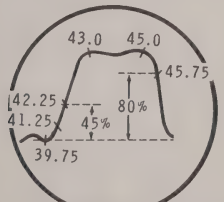


FIG.1

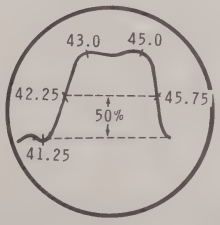
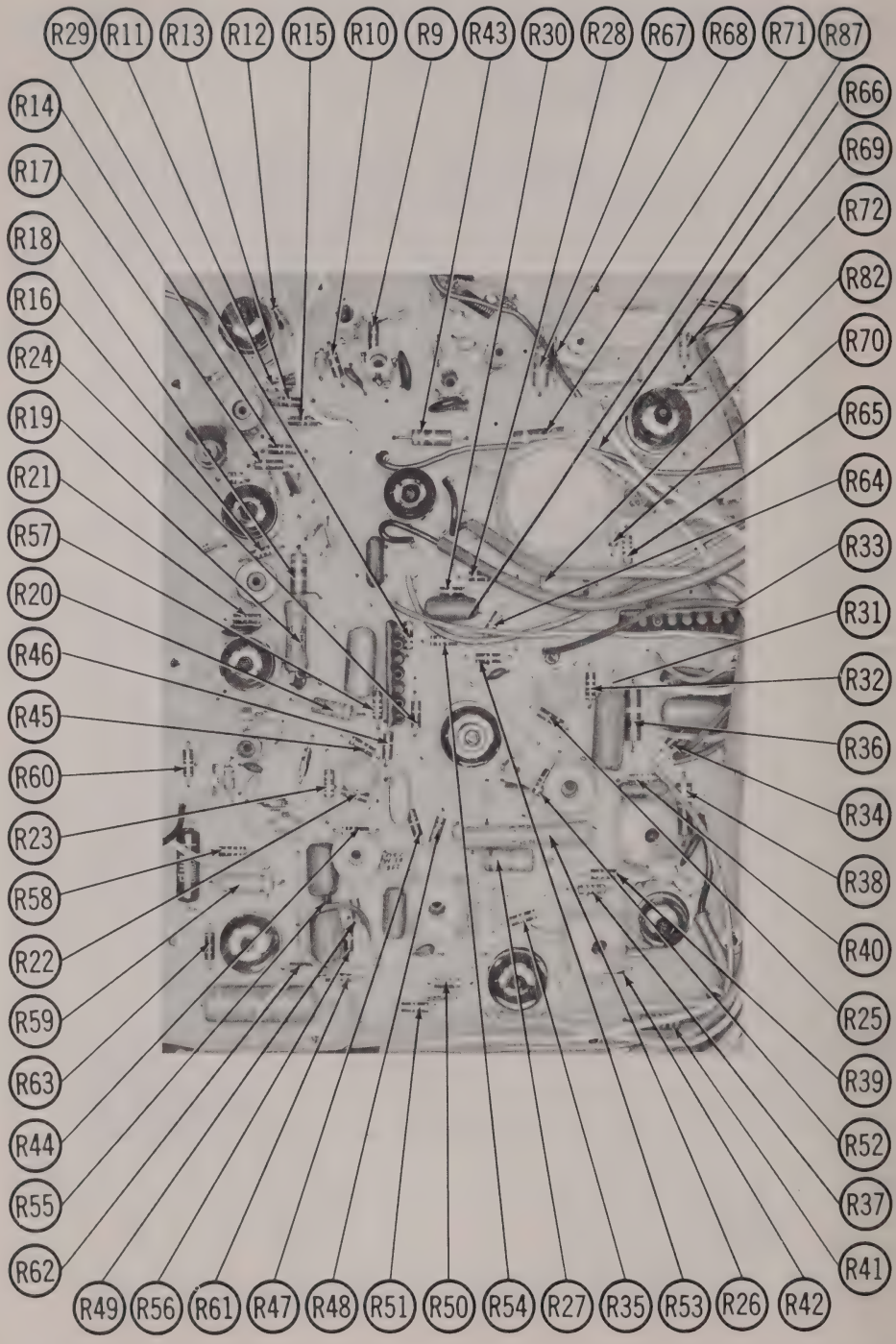
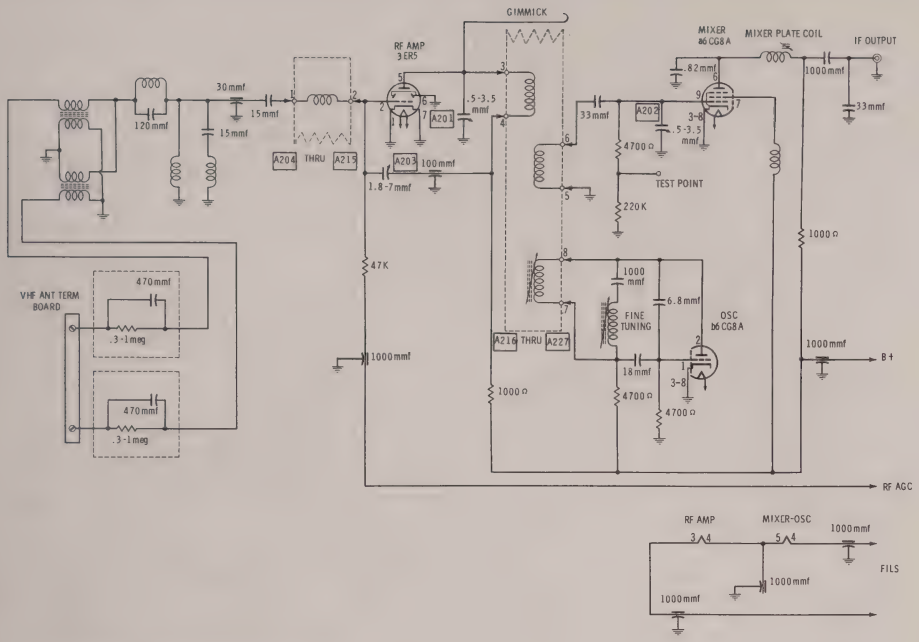


FIG. 2

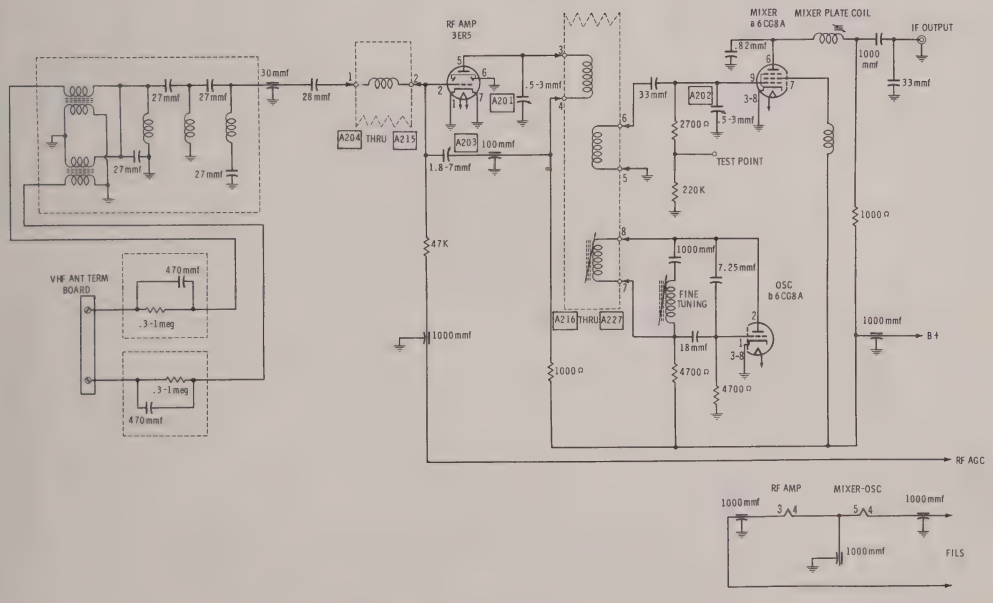


PRINTED BOARD - RESISTOR IDENT.



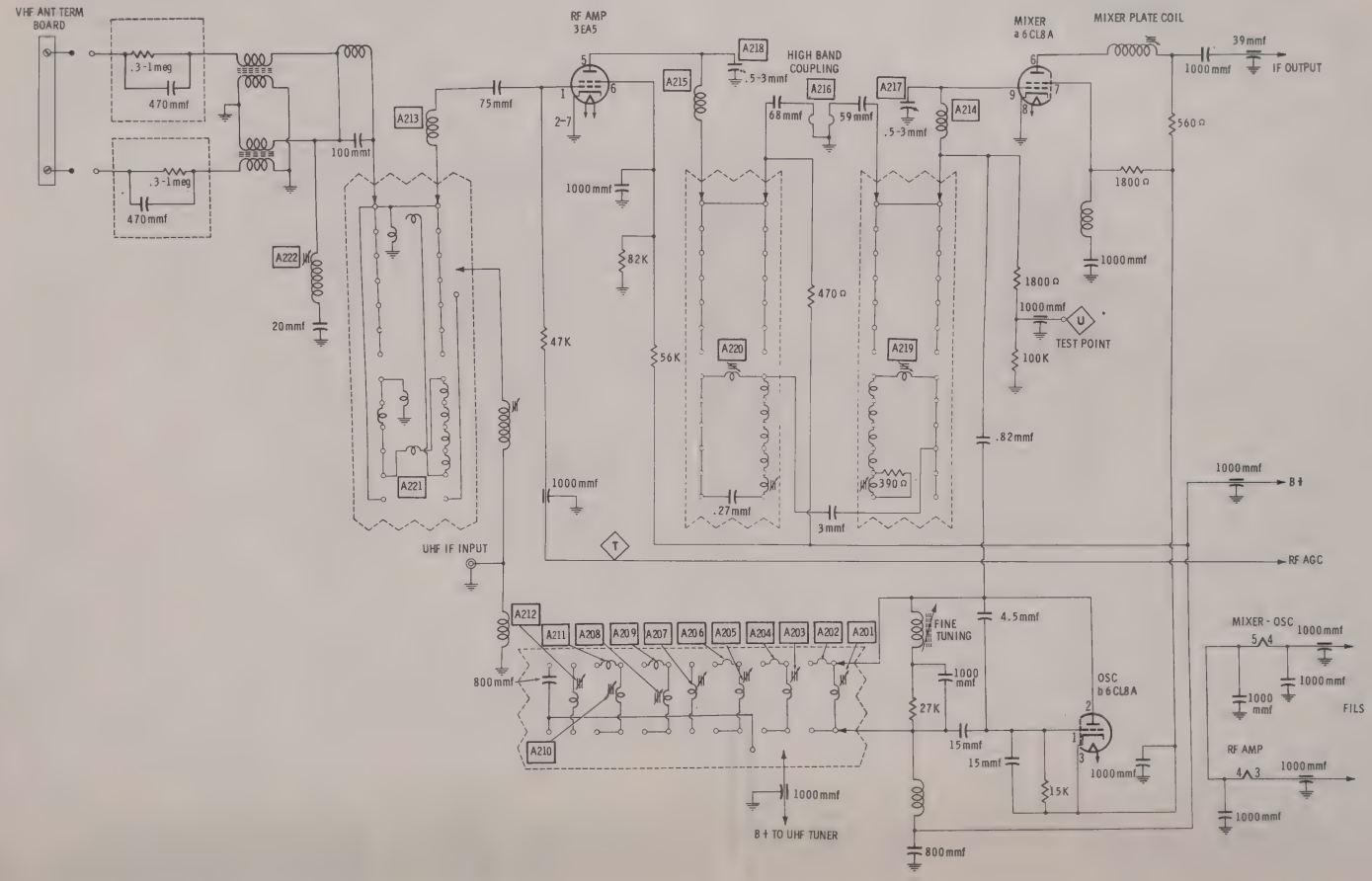
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1961

VHF TUNER 470V067H01



A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1961

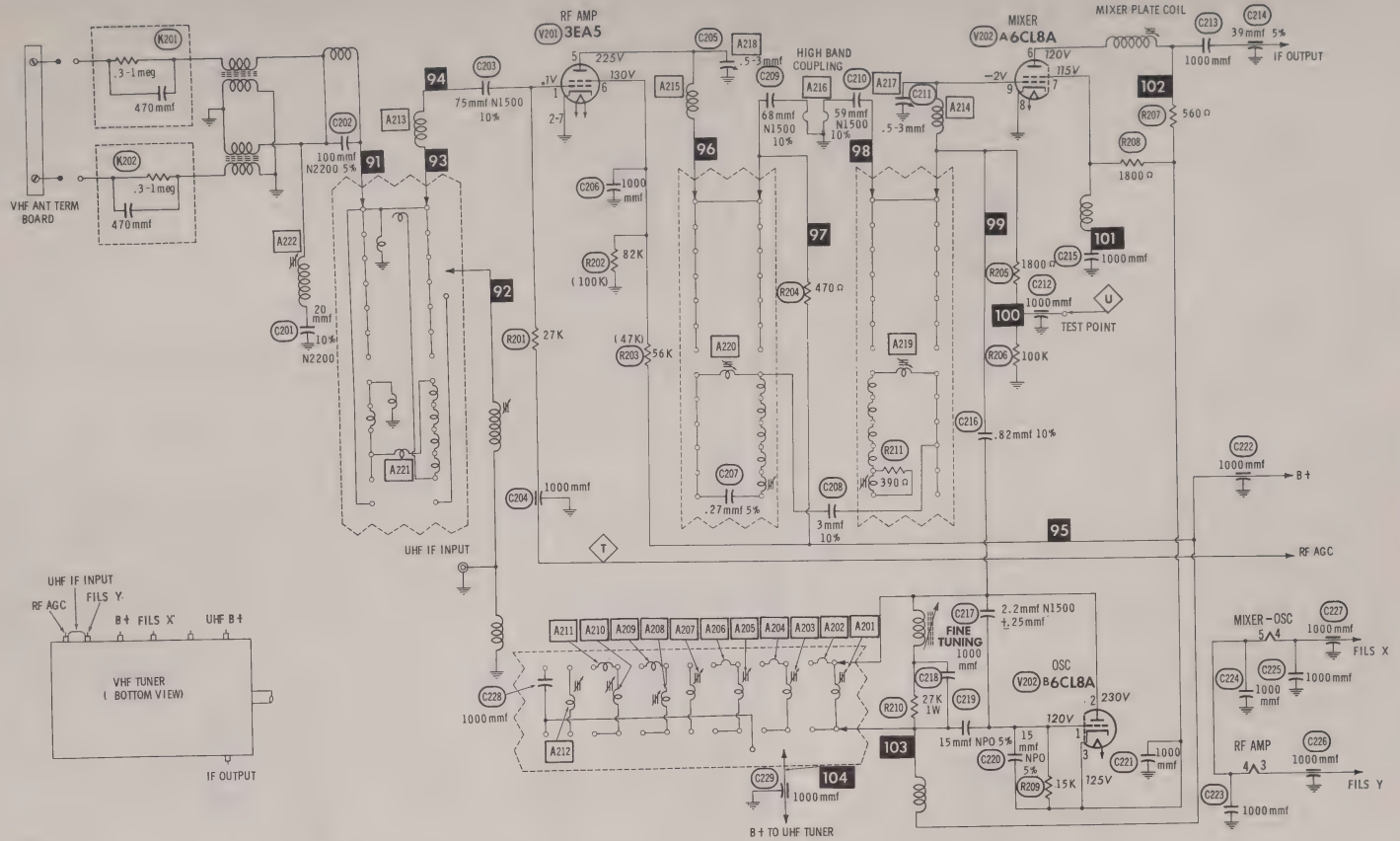
VHF TUNER 470V070H02



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1961

VHF TUNER WITH UHF PROVISIONS 470V066H03

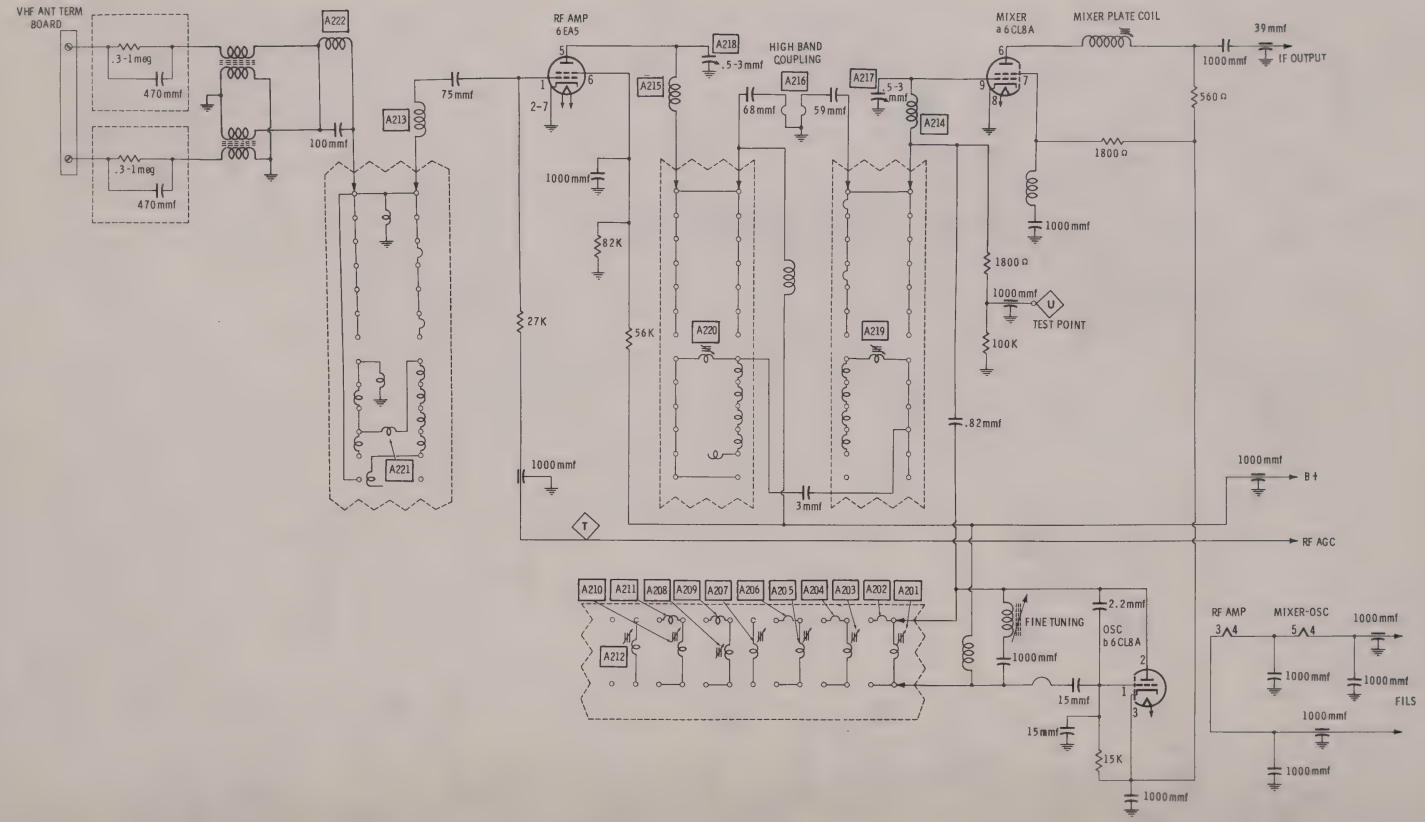


A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

©Howard W. Sams & Co., Inc. 1961

VHF TUNER WITH UHF PROVISIONS 470V066H01, 470V066H02

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1961

VHF TUNER 470V065H02

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	4BZ6	V7	Audio Output	6AQ5A
V2	2nd Video IF Amp.	4BZ6	V8	Vert. Mult.- Vert. Output	8CS7
V3	3rd Video IF Amp.	4BZ6 (4CB6) *	V9	Horiz. Mult.	8CG7
V4	Video Output - Sync Sep.	8AW8A	V10	Horiz. Output	17DQ6A
V5	Sound IF Amp.- Noise Inverter	6FV8	V11	Damper	17D4
V6	Audio Detector	4DT6	V12	HV Rectifier	1G3GT

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V13	17EBP4 19AHP4					

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	160	200	218V021H01	AFH1-31-75	XA0266	WP131.5	TMS-1400	TVL-1473	
C2A	▲ 160	350	218V025H36	AFH3-29-98		WP332.44	TMD-2440	TVLS-3625.5*	
B	■ 120	300					TD-150-300		
C	▲ 30	300							
C3A	▲ 20	350	218V025H45	PWH4-97-92			TMQ-4200 †	PCLS-4605.11*	
B	▲ 4	350							
C	■ 20	25							
D	100	6							
C4	30	450	218V009H02	PRS1740	BR3045	TC77	TD-30-450	TVA-1711	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use printed circuit adapter kit TMA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.22	200V			P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C6	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	.15	200V			P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C8	4.7	N750	±.25mmf			DTN-5	C10V5U	CCTN-050	CN7-547	10TCU-V50
C9	10	NPO	5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C10	47	NPO	5%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C11	10	NPO	5%		NPO-DI 10	DTZ-10	C10Q1C	CCD-100	CNO-410	10TCC-Q10
C12	.75mmf		5%	#217V007A58						
C13	43	NPO	5%		NPO-SI 43	TCZ-43	C10Q43C			
C14	800				BPD-0008	DD-801	L10T8	CCD-801	B-382	10TS-T80
C15	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C16	800				BPD-0008	DD-801	L10T8	CCD-801	B-382	10TS-T80
C17	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C18	2.2		5%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C19	68	NPO	10%		NPO-SI 68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C20	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	800				BPD-0008	DD-801	L10T8	CCD-801	B-382	10TS-T80
C23	1500				BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C24	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C25	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C26	3.3	N750		(4.7) †					CN7-533	10TCU-V33
C27	10	NPO	5%	(6.8) †	NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C28	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C29	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C30	.15	200V			P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C31	56	N220	10%					*		10TCR-Q56
C32	.22	400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C33	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C34	3.3		5%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C35	4.7		5%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C36	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C37	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C38	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C39	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C40	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C41	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	.01	600V			P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C43	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C45	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	150				DI-150	DD-151	L10T15	CCD-151	B-315	10TS-T15
C47	.0033	600V	10%		V84C6D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C48	.015	1000V			P1088N-015	DD16-153	CUB10S15	16DP-4-153	GEM-10115	10TM-S15
C49	.047	600V	10%		V84C6S47-10%		PM6S47	6DP-3-473	GEM-1615	6TM-S47
C50	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C51	.33	200V			P288N-33		CUBP33	2DP-5-334	GEM-2033	2TM-P33
C52	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C54	19-160			#217V505H01				463		
C55	68	N220	10%					*		10TCR-Q68
C56	1000		10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-21
C57	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C59	.33	600V			P688N-33		CUB6P33	6DP-6-333	GEM-6033	6TM-P33
C60	150	5000V	N1500 5%	#215V300H55 ①						

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C61	470	2000V 10%	#215V3001H66 ②						
C62	1500	1400V		HVD-15-1000	DD30-152	HVC182D15	3CCD-152	21HV-215	30GA-D15
C63	.033	600V		[illegible]	DD-333	CUB6333	6DP-3-333	GEM-6133	6TM-S33
C64	680			[illegible]	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C65	680			BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C66	680			[illegible]	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C67	.1	600V		P988N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10

Westinghouse Part Number.
† Used in later production of Chassis V-2413-1, -2.
↑ Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Later production of chassis V-2384-5, -6, -14, -15 use 1700mfd ② 500V (Pt. #215V3001H57).
Chassis V-2413-1, -2 use 110mmf ② 5KV (Pt #215V3001H89).
② Later production of chassis V-2384-5, -6, -14, -15 use 680mfd ② 1500V (Pt. #215V3001H62).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	‡	270V078H01	F1-40	RTV-699 *		UK415-S	Brightness Note 1
B	500K	‡		R2L-41 * Not Req.				Volume Note 1
C	Switch							Push-Pull Off-On
R2A	60K	‡	270V077H02	F1-30	RTV-700 *	CU-1261	U6416	Horiz. Hold Note 2
B	2meg	‡		R2-67 *				Vert. Hold Note 2
R3A	15K	‡	270V080H04	AB-30	A47-15K-S	B11-118	U26	Contrast Note 3
B	Shaft			Not Req.	B&S		AK-35	
R4	5meg	‡	270V038H06	TT-87	B47-5meg-S	HLC5	DS-37	Height
R5A	500K	‡	270V038H05	TT-89	B47-500K-S	B11-133	PTA56L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM6	Not Req.	

■ "STA-LOC" Equivalent: FA55L, RUP65A*, OS1000A.
▲ "STA-LOC" Equivalent: FA75L, RU2SL, OS2000A, US500 *
† "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B11-125, P17-031 (Panel)
(Not available as a factory assembled unit). B11-139, JU-113 (Rear) *
* File flat for knob.
Note 1. Chassis V-2384-5, -6, V-2412-1, -2 use Part #270V078H03, same replacements as above.
Note 2. Chassis V-2384-5, -6, use Part #270V077H01, same replacements as above.
Chassis V-2413-1, -2 use Part #270V077H04.
Note 3. Some versions may use Part #270V080H01, same replacements as above.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	12K 4W ①	PW5-12K	5W-8Q-12K	
R7	680Ω 2W ②			
R8	5600Ω ①			
R9	5100Ω			
R10	5600Ω			
R11	6800Ω			
R12	47Ω			
R13	560Ω			
R14	100K			
R15	100K			
R16	47K			
R17	1.2Ω			
R18	680Ω 1W			
R19	10K 3W	PW3-10K	3G-10K	
R20	47K 1W			
R21	150Ω			
R22	5600Ω			
R23	3900Ω			
R24	1meg			
R25	1600Ω			
R26	3900Ω 5W	PW5-3900	5W-8Q-3900	
R27	1500Ω 2W			
R28	2700Ω			
R29	47Ω			
R30	10Ω			
R31	180K			
R32	470K			
R33	22K			
R34	15K			
R35	100K			
R36	82K 1W			
R37	22K			
R38	680K 1W			
R39	120K			#690V011H08
R40	560K			
R41	33K 1W			
R42	820Ω			
R43	330Ω 1W			
R44	470K			
R45	100K			
R46	15meg			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R47	220K			
R48	20meg			
R49	1.8meg			
R50	1.8meg			
R51	220K			
R52	18K			
R53	100K			
R54	33K			
R55	15K			
R56	1meg			
R57	680K			
R58	180K			
R59	82K 1W			
R60	150K			
R61	1meg			
R62	150Ω			
R63	100Ω			
R64	8200Ω			
R65	680K			
R66	47K			
R67	47K 1W			
R68	100K			
R69	180K			
R70	56K			
R71	3000Ω 1W			
R72	1000Ω			
R73	150Ω			
R74	470K			
R75	7500Ω 4W ③	PW5-7500	5W-8Q-7500	
R76	2700Ω 3W	PW3-2700	3G-2700	
R77	4.7Ω			
R78	560Ω			
R79	560Ω			
R80	8Ω (Cold)			
R81	4700Ω 1W			
R82	18K 2W			
R83	1500Ω 3W	PW3-1500	3G-1500	
R84	10Ω 15W	PW15-10	15W-8Q-10	
R85	30Ω 10W	PW10-30	10W-8Q-30	
R86	15Ω 1W			
R87	180K			

① UHF Models Only.
② 680Ω 2W (When Tuner #470V066H01, H02, H03 is used).
5600Ω 5W (When Tuner #470V070H02 and 470V067H01 is used).
690Ω 1W (When Tuner #470V065H02 is used).
③ Early production of Chassis V-2412-1, -2 use 2700Ω and 12K (in series);
Later production of Chassis V-2412-1, -2 use single 12K.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	RF Choke (.18uh)	230V065H01		4582		TF76	
L2	41.25MC Trap	230V069H02				TE237	
L3	47.25MC Trap	230V076H02				TE260	
L4	1st Video IF	235V049H01				TE253	
L5	47.25MC Trap	230V076H01				TE259	

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L6	2nd Video IF	235V048H01				TE244	
L7	39.75MC Trap	230V030H01				TE230	
L8	3rd Video IF	235V048H01				TE244	
L9	4th Video IF	235V065H01				TE255	
L10	RF Choke (14uh)	230V019H15		4634	RTC-8524	T862	
L11	RF Choke (4.7uh)	230V019H04	SW-631	4809	RTC-8519	T977	
L12	Peaking (140uh)	230V034H03	TV-196	6130	RTC-8575	T343	
L13	Peaking (500uh)	230V034H04	TV-188	6174	RTC-8592	T353	
L14	4.5MC Trap	230V030H02				TE231	
L15	Peaking (140uh)	230V034H03	TV-196	6130	RTC-8575	T343	
L16	Peaking (800uh)	230V034H10	TV-207	6156	RTC-8588	T357	
L17	1st Sound IF	230V083H01					
L18	2nd Sound IF	235V048H01				TB843	
L19	Quadrature	230V031H01				TE234	
L20	RF Choke (14uh)	230V019H10		4634	RTC-8524	T862	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L21	Horiz. Stabilizer	230V032H01					HS-16		TA140

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ^)	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L22	.240A	70Ω	1 Hy.	430V099H01	C-3996 ①	C-2343	26C44 ①	C-34X		① Drill new mounting hole(s).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	430V005H06			VO-111 ①		A-114X	
	Alt. Vert. Output	430V005H04						
T2	Yoke (Horiz. 20MH (110°) Vert. 31MH)	490V008H01 ②	MDF-111	PCM-1634 ③④⑤	DY-46A ③④	Y-53 ③⑤	Y-62 & NW1 ①	
	Yoke	490V008H02 †						
	Rear Cover and Centering Device	78V396H01						
	Yoke Clamp	76V014H03						
T3	Horiz. Output	493V007H02						

① Drill new mounting hole(s).
② Yoke less leads, resistors, and rear cover and centering device.
③ Use original yoke damping network.
④ Connect yoke terminal #3 to horizontal output transformer terminal #7, yoke #2 and #7 to horizontal output transformer #4, yoke terminal #1 to horizontal output transformer #3.
⑤ Connect yoke terminal #2 to horizontal output transformer #7, yoke #1 and #3 to horizontal output #4, yoke #7 to horizontal output transformer #3.
② Requires new rear cover and centering device. † Used in 19" Models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	9800Ω	8-8Ω	430V088H02 ① 430V088H01 ②	A-3026 A-3026	A-3877 ① A-3877 ①	24S48 24S51 ①	S-61X S-62Z	① Drill new mounting hole(s). ② Alternate Part Number.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	570V075H01 ①	4A05Z8	①Used in Models H-P3150, U; H-P3210, U; H-P321l, U
	3" x 5"	PM	6-8Ω	570V069H01 ②	3SA05Z6	②Used in Models H-P3310, U; H-P3311, U; H-P3312, U

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Vert. Integrator	3000mmf, 4700mmf, 5000mmf, 5000mmf, 8200Ω, 8200Ω, 22K	219V029H01	
K2	AFC Network	33mmf, 47mmf, 150mmf, 390mmf, 680mmf, 10K, 12K, 560K, 1meg	219V028H04	
K3	Isolation	1000mmf (1400V), 330K	219V004H03	Sprague ACI-8

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: Westinghouse PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.270A	29SV006H03 *	1N1763 *	40H *	SR500 *	* Silicon Type
M2	.270A	29SV006H03 *	1N1763 *	40H *	SR500 *	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Westinghouse PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	*	296V004H01 *	8GC1 *			* Dual Selenium, Common Cathode
M4	1N295 * or 1N87A *	296V006H01		1N295 * or 1N87A *	1N295 * or 1N87A *	* Diode, Video Det., Pigtail

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M5	Tuner	470V066H01 or 470V066H02	VHF with UHF Provisions, Models H-P3150U, H-P3210U, H-P321lU
M6	Tuner	472V035H01	UHF
	Tuner	470V065H02 or 470V067H01	VHF, Models H-P3210, H-P321l, H-P3150
	Tuner	470V067H01	VHF, Models H-P3310, H-P3311, H-P3312
	Tuner	470V070H02	VHF with UHF Provisions, Models H-P3310U, H-P3311U,
	Tuner	470V066H03	H-P3312U
M7	Circuit Breaker	753V006H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

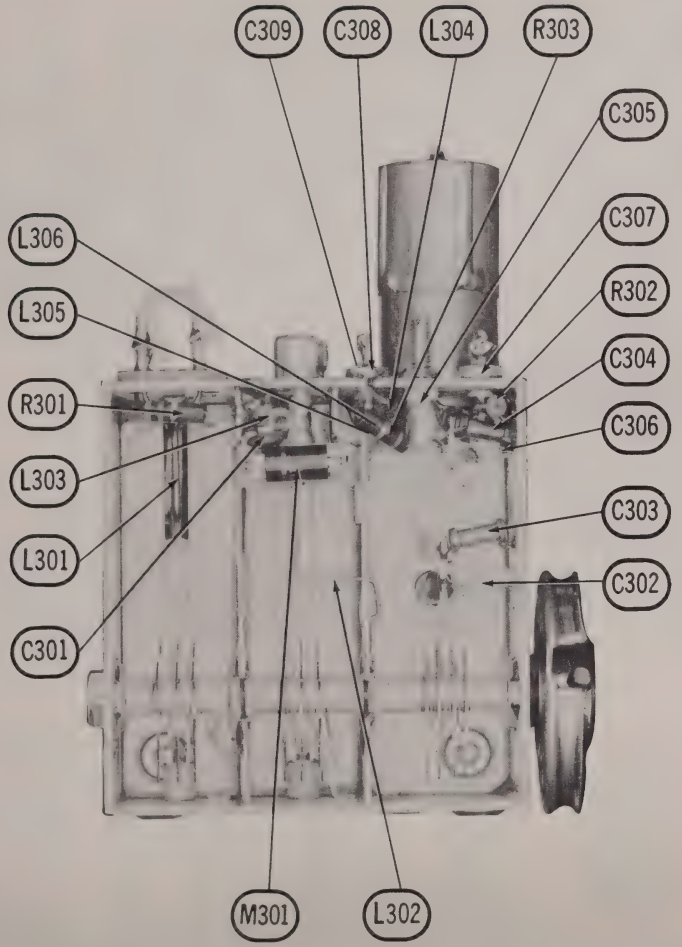
DESCRIPTION	PART NO.	MODEL NO. H-P3150	H-P3150U	H-P3210	H-P3210U	H-P3211	H-P3211U	H-P3310	H-P3310U	H-P3311	H-P3311U	H-P3312	H-P3312U
Mask	610V020H01	X	X										
Mask	610V020H04			X	X	X	X						
Mask	610V023H01							X	X	X	X	X	X
Shield (Picture Tube)	639V004H03	X	X	X	X	X	X						
Shield (Picture Tube)	639V005H02							X	X	X	X	X	X
Knob-VHF Channel Selector	550V169H01	X	X										
Knob-VHF Channel Selector	555V158H01			X	X	X	X						
Knob-VHF Channel Selector	550V158H01							X	X	X	X	X	X
Knob-UHF Channel Selector	550V134H01		X		X		X		X		X		X
Knob-UHF Channel Indicator	550V130H01		X		X		X		X		X		X
Knob-Fine Tuning	550V119H01	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Contrast, Vert. Hold	550V123H01	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Contrast (Outer)	550V124H02	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Brightness, Horiz.	550V124H01	X	X	X	X	X	X	X	X	X	X	X	X
Handle	787V196H02				X		X						
Handle	787V197H01							X	X	X	X	X	X
Cabinet	510V021H01	X											
Cabinet	510V021H02		X										
Cabinet	510V018H03			X									
Cabinet	510V018H04				X								
Cabinet	510V018H05					X							
Cabinet	510V018H06						X						
Cabinet	510V023H01							X					
Cabinet	510V023H02								X				
Cabinet	510V023H03									X			
Cabinet	510V023H04										X		
Cabinet	510V023H05											X	
Cabinet	510V023H06												X
Power Cord (AC) , Polarized	751V016H01	X	X	X	X	X	X	X	X	X	X	X	X
Adapter, Polarized AC Plug	754V041H01	X	X	X	X	X	X	X	X	X	X	X	X

WIRING DATA

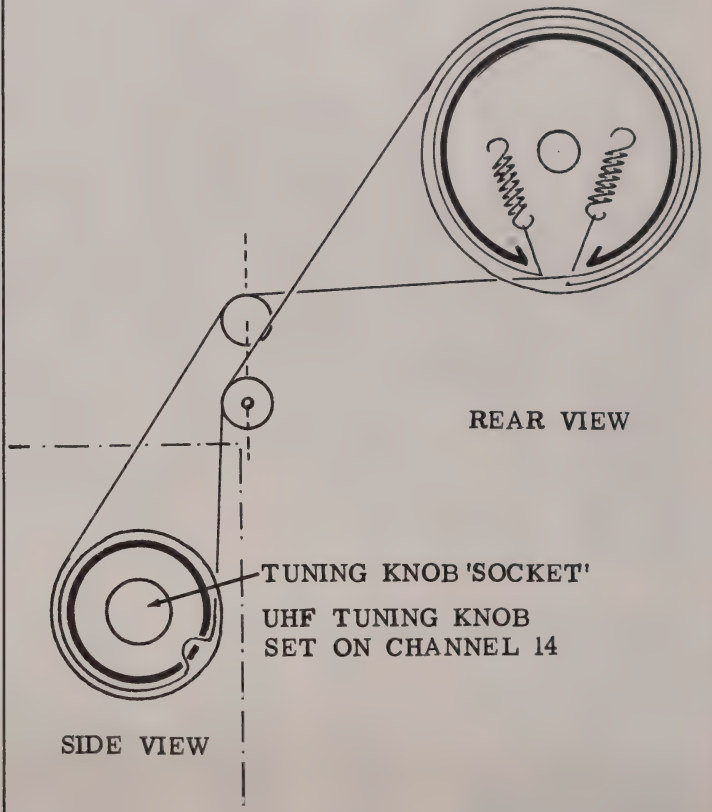
High Voltage Lead	Use BELDEN No. [illegible]
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. [illegible]
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-In	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8465 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

WESTINGHOUSE CHASSIS V-2384-5, V-2384-6, V-2384-14, V-2384-15, V-2412-1, V-2412-2

FOLDER 2



UHF TUNER 472V035H01



UHF DRIVE CORD STRINGING

UHF TUNER PARTS LIST AND DESCRIPTIONS

472V035H01

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V301	UHF Osc.	3AF4A			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C301	33 10%		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C302	1.5 N1400	#690V013H43						
C303	.5 N750	#690V013H44						
C304	.5 N750	#690V013H44						
C305	.5-3			829-3		CV-1	CT565	
C306	135 10%	#690V013H42						
C307	1000		EF-001	MFT-1000		CCF-102	CT280A	
C308	1000		EF-001	MFT-1000		CCF-102	CT280A	
C309	1000		EF-001	MFT-1000		CCF-102	CT280A	

Westinghouse Part Number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R301	680K				R303	5600Ω			
R302	100Ω								

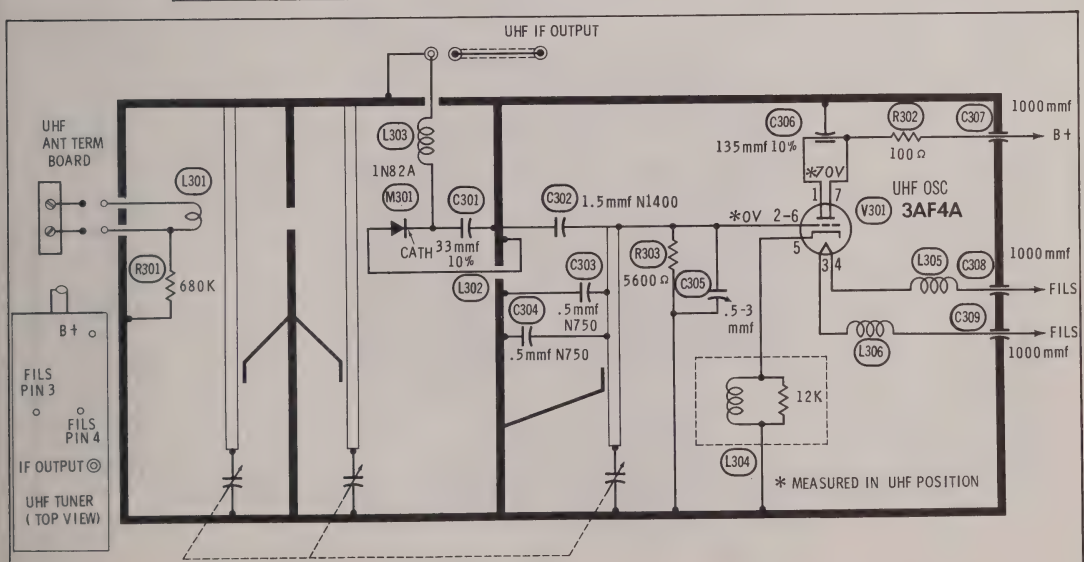
COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L301	Antenna	690V013H46	
L302	RF Choke	690V013H47	
L303	IF Coupling	690V013H48	

ITEM No.	USE	Westinghouse PART No.	NOTES
L304	RF Choke	690V013449	
L305	Fil. Choke	690V013450	
L306	Fil. Choke	690V013450	

SIGNAL DIODES

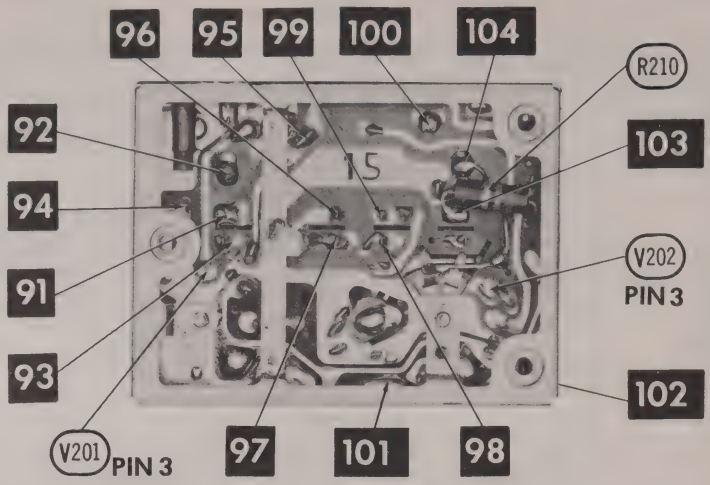
ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M301	1N82A	V-8634-3		1N82A	1N82A	UHF Mixer



A PHOTOFACT STANDARD NOTATION SCHEMATIC

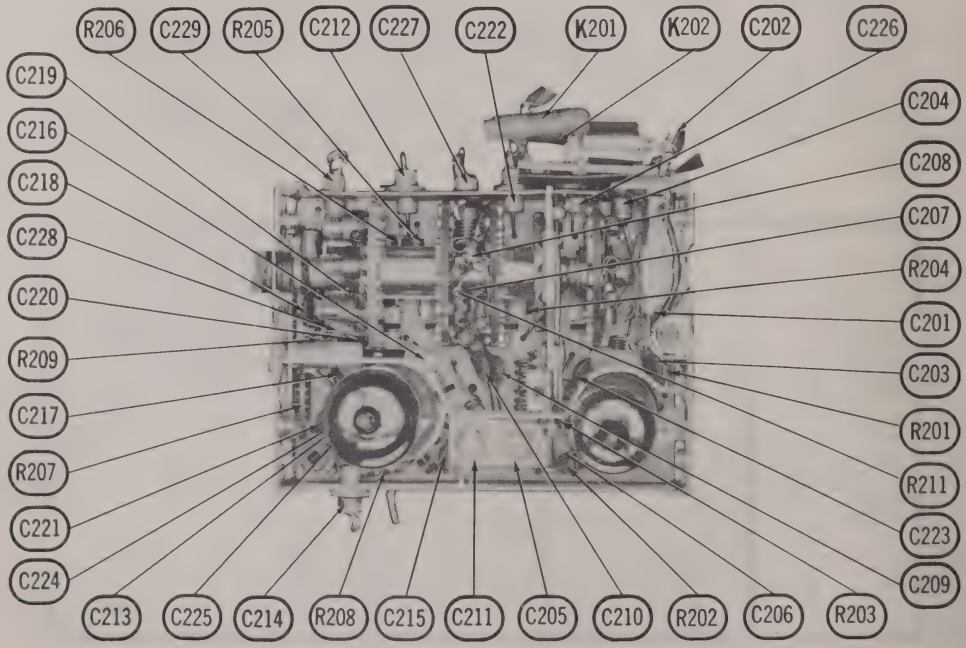
©Howard W. Sams & Co., Inc. 1961

UHF TUNER 472V035H01



A Howard W. Sams CIRCUITRACE® Photo

VHF TUNER 470V066H02 - BOTTOM VIEW



VHF TUNER 470V066H02 - TOP VIEW
CAPACITOR, RESISTOR, MISC. IDENT.

VHF TUNER PARTS LIST AND DESCRIPTIONS

470V066H02

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	3EA5	V202	Mixer - Osc.	6CL8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	20	N2200	10%	#690V013H77				*		
C202	100	N2200	5%	#690V013H10				*		
C203	75	N1500	10%	#V-8747				*		
C204	1000				EF-001	MFT-1000		CCF-102	CT280A	
C205	.5-3					829-3		CV-1	CT565	
C206	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C207	.27		5%	#690V026H20						
C208	3		10%		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C209	68	N1500	10%	#215V126A80		TCL-68		*		
C210	59	N1500	10%	#690V013H55				*		
C211	.5-3					829-3		CV-1	CT565	
C212	1000				EF-001	MFT-1000		CCF-102	CT280A	
C213	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	39		5%	#690V013H79						
C215	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	.82		10%	#690V026H15						
C217	2.2	N1500	±.25mmf	#V-19013-1				*		
C218	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C219	15	NPO	5%			DTZ-15	C10Q15C		CNO-415	10TCC-Q15
C220	15	NPO	5%			DTZ-15	C10Q15C		CNO-415	10TCC-Q15
C221	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C222	1000				EF-001	MFT-1000		CCF-102	CT280A	
C223	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C224	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C225	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C226	1000				EF-001	MFT-1000		CCF-102	CT280A	
C227	1000				EF-001	MFT-1000		CCF-102	CT280A	
C228	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C229	1000				EF-001	MFT-1000		CCF-102	CT280A	

Westinghouse Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

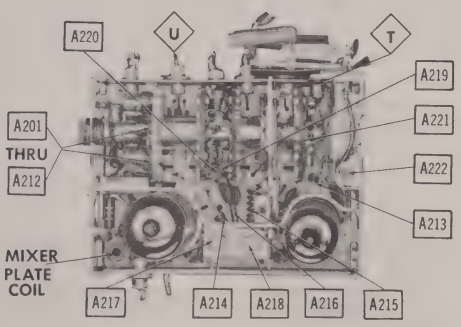
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS	ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.				IRC PART No.	WORKMAN TV PART No.	
R201	27K				R207	560Ω			
R202	82K			(100K) *	R208	1800Ω			
R203	56K			(47K) *	R209	15K			
R204	470Ω				R210	27K 1W			
R205	1800Ω				R211	390Ω			
R206	100K								

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K201	VHF Antenna Isolation	470mmf, .3-1meg	690V013H78	Centralab RC-471 Sprague AC1-1
K202	VHF Antenna Isolation	470mmf, .3-1meg	690V013H78	Centralab RC-471 Sprague AC1-1



VHF TUNER 470V066H02 — TOP VIEW — ALIGNMENT IDENTIFICATION

FOLDER 2

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS - TUNERS #470V065H02, 470V066H01, H02, H03

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage Lead should be securely taped and kept away from the chassis.
Suggested Alignment Tools: A201, A208, A210, A212, A219 thru A222.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A217, A218.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing slugs are adjusted by bending toward or away from switch wafer.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Across antenna terminals.	209.75MC (400∿ 30% AM Mod.)	13	Across Video Det. Load	A201	Adjust for MINIMUM scope indication.
2.	"	"	203.75MC	12	"	A202	"
3.	"	"	197.75MC	11	"	A203	"
4.	"	"	191.75MC	10	"	A204	"
5.	"	"	185.75MC	9	"	A205	"
6.	"	"	179.75MC	8	"	A206	"
7.	"	"	173.75MC	7	"	A207	"
8.	"	"	81.75MC	6	"	A208	"
9.	"	"	75.75MC	5	"	A209	"
10.	"	"	65.75MC	4	"	A210	"
11.	"	"	59.75MC	3	"	A211	"
12.	"	"	53.75MC	2	"	A212	"

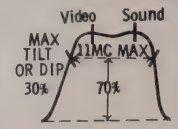


FIG.201

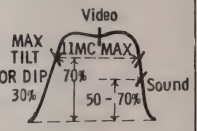


FIG.202

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4 volt bias supply to point Ⓣ. Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A213	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
14.	"	"	"	213MC	"	"	A214, A215	If necessary, adjust by expanding or compressing coil turns for maximum symmetrical response centered about 113MC marker.
15.	"	"	"	210MC 216MC	"	"	A216	Adjust spacing between "gimmick" wires (A216) for proper bandwidth as in Fig. 201.
16.	"	"	177MC	177MC	7	"	A217, A218	Adjust to obtain correct tilt on top of curve as in Fig. 203 to compensate for the tuning effect of Channel 13. Repeat step 14, retouch only SLIGHTLY. Repeat step 16.
17.	"	"	85MC	87.75MC	6	"	A219, A220	Adjust for approximate correct bandwidth with sound carrier between 50 and 70% as in Fig. 202.
18.	"	"	"	83.25MC	"	"	A221	Adjust for maximum gain at 83.25MC marker. Repeat step 17, adjust A219 and A220 only SLIGHTLY.
19.	"	"	Not Used	43.5MC (400∿ 30% AM Mod.)	4	Across Video Det. Load.	A222	Adjust for MINIMUM 400∿ indication on scope.

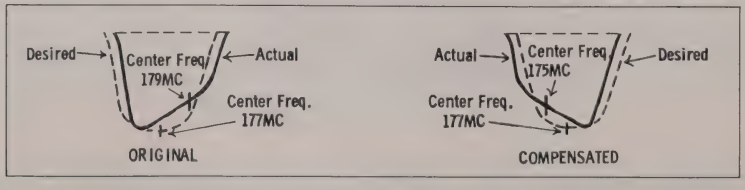


FIG. 203

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS - TUNERS #470V067H01, 470V070H02

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT
The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Use 10MC sweep unless otherwise noted.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (D). Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A205	
		201MC	199.25MC 203.75MC	11		A206	
		195MC	193.25MC 197.75MC	10		A207	
		189MC	187.25MC 191.75MC	9		A208	
		183MC	181.25MC 185.75MC	8		A209	
		177MC	175.25MC 179.75MC	7		A210	
		85MC	83.25MC 87.75MC	6		A211	
		79MC	77.25MC 81.75MC	5		A212	
		69MC	67.25MC 71.75MC	4		A213	
		63MC	61.25MC 65.75MC	3		A214	
		57MC	55.25MC 59.75MC	2		A215	

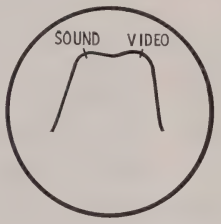


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

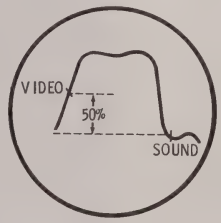
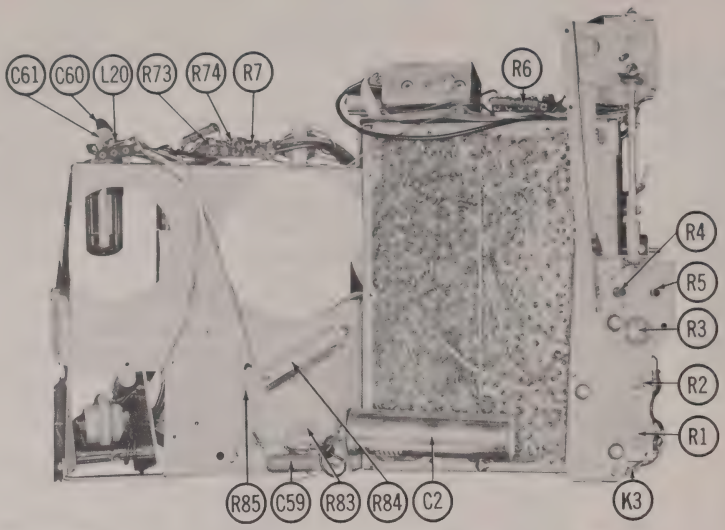
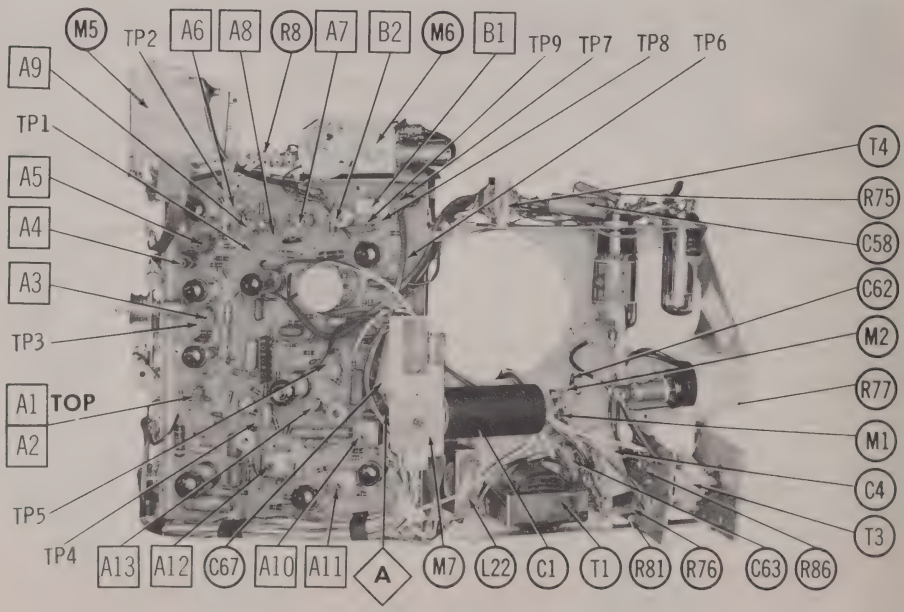


FIG.202

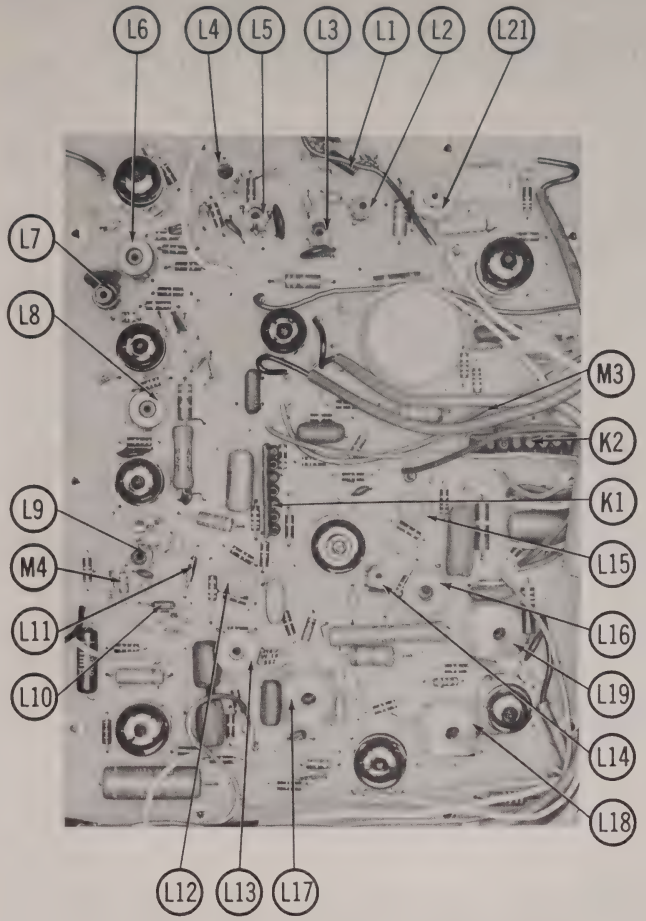


CHASSIS - FRONT VIEW

TP1	.6V	IF AGC	TP6	-.4V	AFC GRID CIRCUIT
TP2	.5V	1st IF GRID	TP7	-5V	HORIZ HOLD CONTROL
TP3	0V	3rd IF GRID	TP8	240V	HORIZ MULT PLATE CIRCUIT
TP4	-.1V	VIDEO DET OUTPUT	TP9	240V	HORIZ MULT B+
TP5	60V	PIX TUBE CATH			



CHASSIS - REAR VIEW

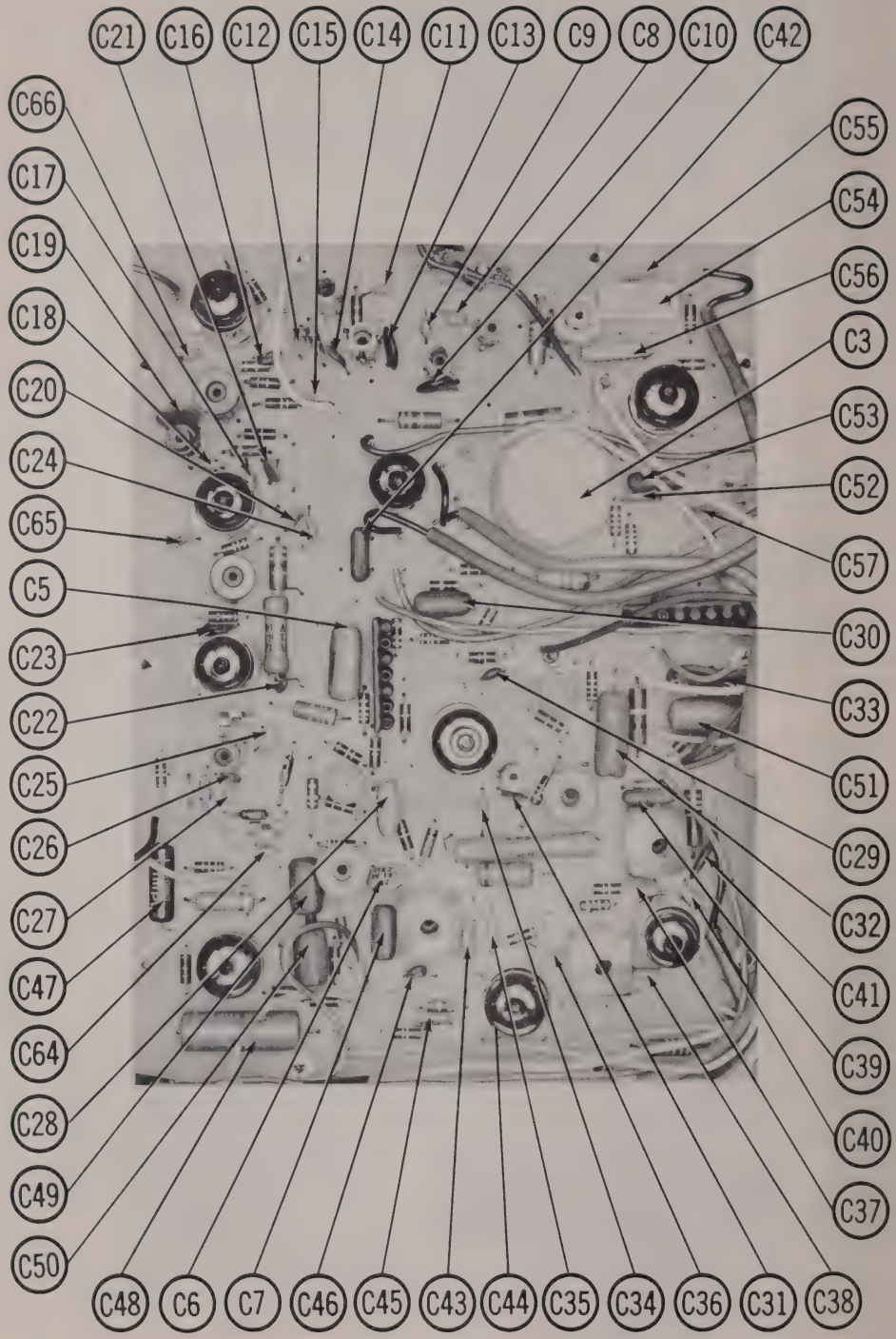


PRINTED BOARD
INDUCTOR & MISCELLANEOUS IDENTIFICATION

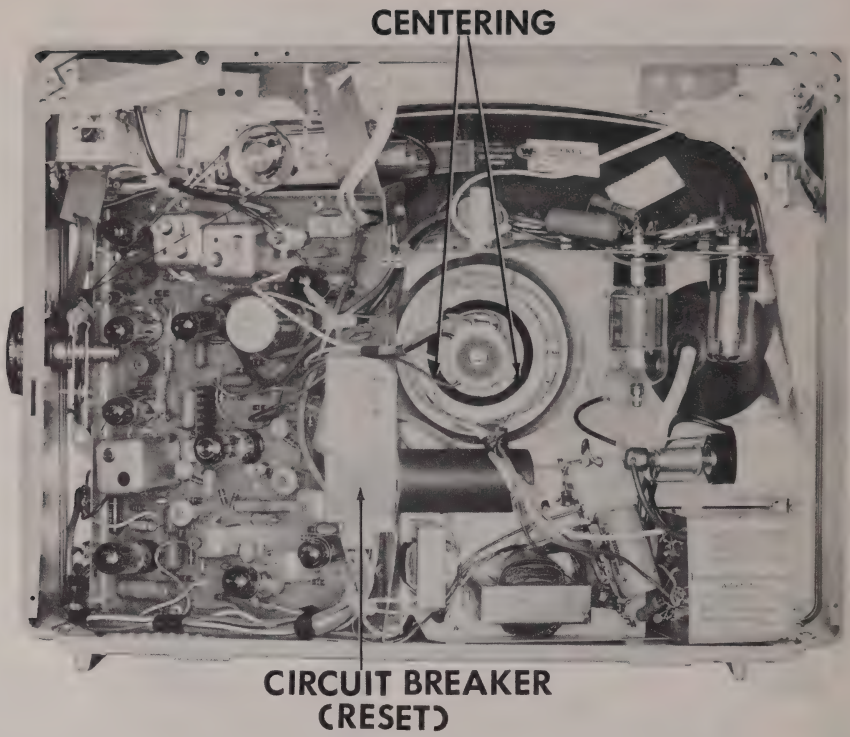
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	600K	47Ω	18Ω	21Ω	▪572Ω	▪572Ω	0Ω		
V2	4BZ6	55K	INF	21Ω	25Ω	†750Ω	†750Ω	▪12Ω		
V3	4BZ6	.1Ω	150Ω	25Ω	29Ω	†10K	†47K	0Ω		
V4	8AW8A	0Ω	1.8meg	†80K	45Ω	52Ω	47Ω	1meg	†18K	†5000Ω
V5	6FV8	1.5meg	†20K	330Ω	37Ω	42Ω	†40K	†40K	0Ω	100K
V6	4DT6	.4Ω	820Ω	42Ω	45Ω	†680K	†33K	560K		
V7	6AQ5A	• 1000Ω	330Ω	60Ω	52Ω	†1900Ω	†1500Ω	NC		
V8	8CS7	†4250Ω	NC	• 1.4meg	37Ω	29Ω	†500K	• 1.4meg	0Ω	100Ω
V9	8CG7	†57K	• 200K	1000Ω	5Ω	11Ω	†48K	2.2meg	1000Ω	0Ω
V10	17DQ6A	NC	60Ω	NC	†7500Ω	470K	NC	80Ω	0Ω	TOP CAP †25Ω
V11	17D4	NC	NC	¶ 3meg	NC	†70Ω	NC	80Ω	100Ω	
V12	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †600Ω
V13	17EBP4	0Ω	22K	†18K	0Ω	NC	NC	• 170K	5Ω	
V201	3EA5	600K	0Ω	18Ω	16Ω	†1200Ω	†50K	0Ω		
V202	6CL8A	▪15K	†750Ω	INF	12Ω	16Ω	▪560Ω	▪1800Ω	0Ω	100K
V301	3AF4A	†• 13K	5600Ω	11Ω	12Ω	.1Ω	5600Ω	†• 13K		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V11.
NC NO CONNECTION
▪ MEASURED FROM PIN 3 OF V202.
▪ MEASURED FROM PIN 2 OF V2.
• MEASURED IN "UHF" POSITION.



PRINTED BOARD - CAPACITOR IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short clip lead across the Horizontal Stabilizer Coil (L21).

Set the Horizontal Hold Control to the center of its range.

Connect the DC probe of a VTVM to TP-6. Common to chassis.

Tune in a TV station and adjust the Horizontal Multivibrator Trimmer (B1) for zero volts on the VTVM. If zero can be approached but not reached, set the Horizontal Hold Control slightly to one side of center for zero voltage.

Remove the jumper from L21 and adjust the Horizontal Frequency Slug (B2) for zero reading on the meter. Check lock-in action by switching from channel to channel. The picture should pull into synchronization on all channels.

DISASSEMBLY INSTRUCTIONS

CHASSIS AND PICTURE TUBE ASSEMBLY REMOVAL
MODELS H-P3210, U; H-P3211, U; H-P3150, U

1. Remove 2 screws holding rear cover and disconnect antenna lead-in.
2. Remove rear cover.
3. Remove 8 push-on type knobs at front of cabinet and UHF knob at side.
4. Remove speaker.
5. Remove 2 screws at top and 1 at side of cabinet holding chassis to cabinet.
6. Remove chassis bolts (at bottom).
7. Remove chassis and picture tube.

CHASSIS REMOVAL MODELS H-P3310, 11, 12

1. Remove control knobs, rear cover, and disconnect antenna lead-in.
2. Remove brace behind tuner (1 screw) and swing brace to one side.
3. Disconnect speaker leads and remove speaker and grill.
4. Remove 3 screws holding chassis and control panel to cabinet.
5. Remove 7 chassis screws.
6. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder

PRODUCTION CHANGE BULLETIN 261

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 509

SYLVANIA CHASSIS 550-1, -2, -3, -7, -9

Sylvania Models 23C30B, M, W, 23C31B, F, M, 23C32B, F, M, W, 23C33B, M, W, 23C34B, M, W, 23C35B, F, M, W, 23C36B, M, W, 23C37F, 23C38F, W, 23C39F, 23T15E, 23T16B, M, W, 23T17B, M, W (Ch. 550-1, -2, -3, -7, -9) were covered in PHOTOFACT Folder 2 - Set 509.

The following changes were made by the manufacturer during late production.

TO PROTECT HEIGHT CONTROL

R59 is decreased from 330K to 180K and relocated. The resistor is connected from the junction of R8 and R78 to the 260VB Source.

R60 is decreased from 680K to 150K and relocated. The resistor is connected to R78 and the .033mfd capacitor connecting to lug 1 of T2 (Deflection Yoke).

R77 is omitted. The line connecting R6 (Focus Control) to the .033mfd capacitor, which is connected to lug 1 of T2 (Deflection Yoke), is relocated to the junction of R8 and R78.

C33 is increased from .001mfd to .0047mfd.

TO REDUCE POSSIBILITY OF WIDTH CONTROL FAILURE

R73 is increased from 18K 2 watts to 22K 2 watts.

R74 is decreased from 18K 2 watts to 12K 2 watts.

The .001mfd capacitor from pin 4 of V11 (12DQ6A) to ground is changed to 330mmf.

With these value changes the Width Control Circuit is revised. A partial schematic diagram showing the changes is given in this bulletin on the reverse side.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 27 IN SET 492

ZENITH MODELS ROYAL 675L, LG (CH. 6CT41Z5, 6GT41Z1)

Zenith Model Royal 675L (Ch. 6CT41Z1) was covered in PHOTOFACT Folder 27 - Set 492.

Models Royal 675L, LG (Ch. 6CT41Z5, 6GT41Z1) are electrically similar except for the following changes.

COMPONENT CHANGES

X1 (Converter) is changed from a Type 2N252 to a Type 2N1108.

X2 (1st IF Amp.) is changed from a Type 2N309 to a Type 2N1110.

X3 (2nd IF Amp.) is changed from a Type 2N308 to a Type 2N1111.

X4 (Driver) is changed from a Type R119 to a Type R120.

R7 is omitted. There is no jumper inserted for R7 — it is left open.

L3 (1st IF Transformer) is changed to Part #95-1747.

L4 (2nd IF Transformer) is changed to Part #95-1748.

L5 (3rd IF Transformer) is changed to Part #95-1749.

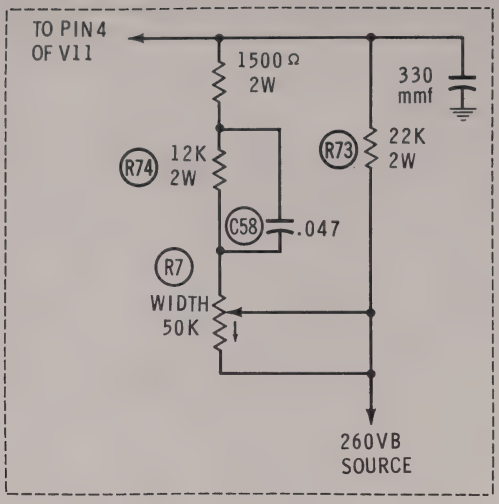
T1 (Driver Transformer) is changed to Part #95-1792.

(Continued On The Reverse Side)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PRODUCTION CHANGE BULLETIN 261
PRODUCTION CHANGE BULLETIN 261
SET 534 FOLDER 3



	R3 is decreased from 120K to 82K. R8 is increased from 2700Ω to 4700Ω. C16 is increased from .02 to .05 and is combined in one unit with C11 (Part #22-3198) 2X .05 @ 500V. C1 is decreased from 16mfd @ 3 volts to 5mfd @ 12 volts (Part #22-2884). C10 and C12 are increased from .02mfd to .05mfd and are combined in one unit (Part #22-3198) 2X .05 @ 500V. C13 and C14 are combined into one unit (Part #22-3198) 2X .05 @ 500V. C2 is increased from 3mfd @ 12 volts to 5mfd @ 12 volts (Part #22-2884). C3 and C4 are changed to 100mfd @ 10 volts (Part #22-3023) on Chassis 6GT41Z1. R1 (Volume Control and Switch) is changed to Part #63-4757 on Chassis 5GT41Z1. M4 (Tuning Cap.) is changed to Part #22-3407 on Chassis 6GT41Z1.

Motorola Models 19P1-1, 19P1-2 (Ch. TS-432) were covered in PHOTOFACT Folder 2 - Set 520.

The following changes were made by the manufacturer during late production.

Chassis Coding C-01

TO ELIMINATE VIDEO BUZZ

R15 is changed from a 390Ω carbon resistor to a 1500Ω rheostat control (Part #17K754422) and relocated. A partial schematic diagram showing the sensitivity control is given in this bulletin on the reverse side.

R58 is decreased from 56Ω to 39Ω.

Chassis Code C-02

COMPONENT CHANGES

L3 is changed to Part #24D65666A02.

L4 is changed to Part #24D65666A04.

L5 is changed to Part #24D65666A04.

L10 is changed to Part #24D65666A03.

A 22Ω 10% ½ watt resistor is added between the Base of X8 (Sound IF) and lug 4 of L20.

C58 (10000mmf) is disconnected from ground and connected to the Emitter of X8 (Sound IF).

Chassis Coding C-04

TO PREVENT LOW LEVEL SOUND DISTORTION

R58 is increased from 56Ω to 68Ω 10% ½ watt.

A Thermistor (275Ω Cold, Part #6C65884A01) is added in parallel with R58.

TO PREVENT POSSIBLE DAMAGE TO X4 (VIDEO AMP)

A .01mfd capacitor and a 680Ω 10% ½ watt resistor in parallel is added between the Collector of X4 (Video Amp.) and L19.

TO REDUCE AIRCRAFT FLUTTER

C8 is omitted.

TO IMPROVE SYNC STABILITY

R64 is decreased from 56K to 33K 10% ½ watt.

COMPONENT CHANGES

A 39Ω 10% ½ watt resistor is added between the Collectors of X21 (Filter Amp.) and X22 (Filter).

R100 is omitted.

R101 is omitted. Terminal 9 of T6 (Horizontal Output Transformer) is connected to the junction of C7 and R33.

Chassis Coding C-05

WIRING CHANGE

Lug 9 of T6 (Horizontal Output Transformer) is relocated. It now connects to the 18VA Source, instead of to the junction of C7 and R33.

Chassis Coding C-06

WIRING CHANGE

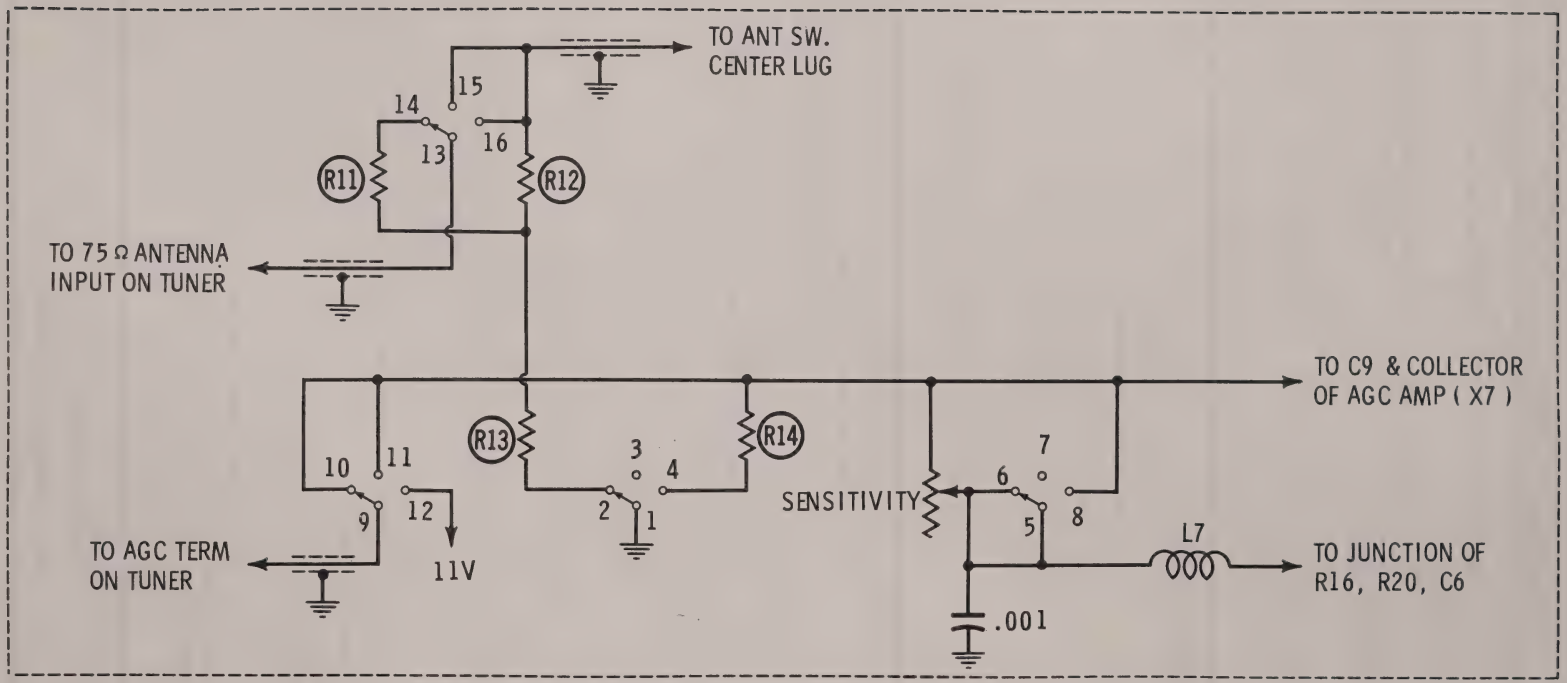
R100 and R101 are re-inserted.

Chassis Coding C-07

COMPONENT CHANGES

R46 is replaced with a jumper wire.

R45 is increased from 4700Ω to 6800Ω.


TO ANT SW.
CENTER LUG
15
14
13
16
R11
R12
TO 75 Ω ANTENNA
INPUT ON TUNER
TO C9 & COLLECTOR
OF AGC AMP (X7)
R13
R14
3
4
7
10
11
6
SENSITIVITY
9
12
2
1
5
8
L7
TO AGC TERM
ON TUNER
11V
TO JUNCTION OF
R16, R20, C6
.001

PHOTOFACT® Folder

CURTIS MATHES MODELS 3016A, 3116A, 3216A, 3316A (Ch. 16A)

CURTIS MATHES MODELS 3016A, 3116A, 3216A, 3316A (Ch. 16A)

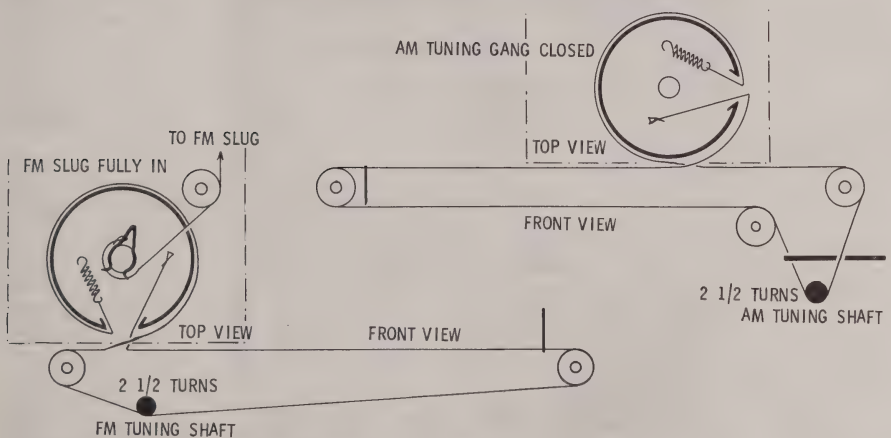
MODEL 3116A

CURTIS MATHES MODELS 3016A, 3116A, 3216A, 3316A (Ch. 16A)

TRADE NAME	Curtis Mathes Models 3016A, 3116A, 3216A, 3316A (Ch. 16A)		
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas, Texas		
TYPE SET	AC Operated 16 Tube FM-AM Receiver with Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	160 Watts, 1.4 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 – 1620KC	FREQ. MOD.	88 – 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #11A6 – SEE SIMILAR COLLARO CONQUEST (REVISED) – PHOTOFACT SET 408 FOLDER 6 OR RECORD CHANGER MANUAL RC-11

DIAL CORD STRINGING

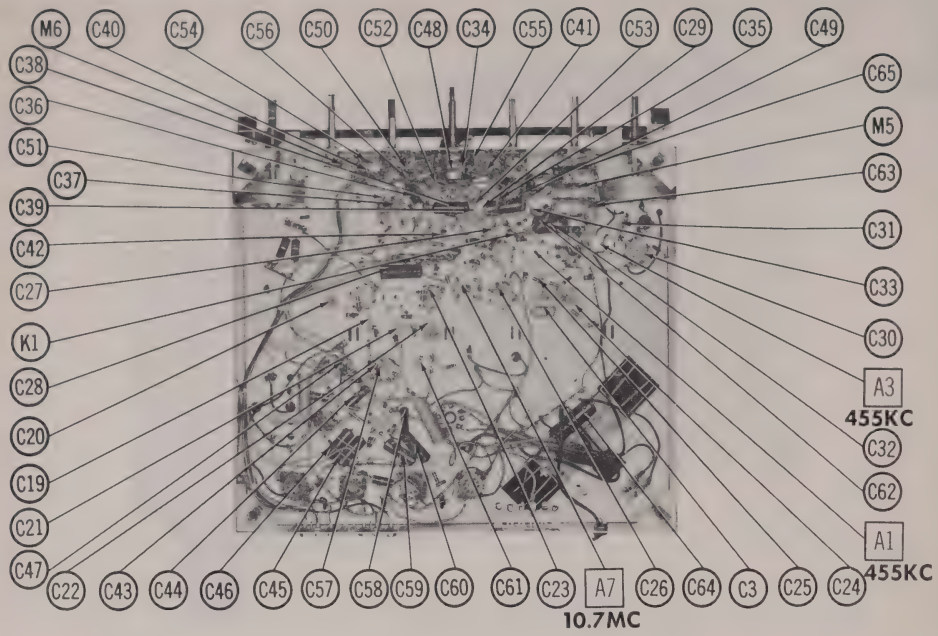


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

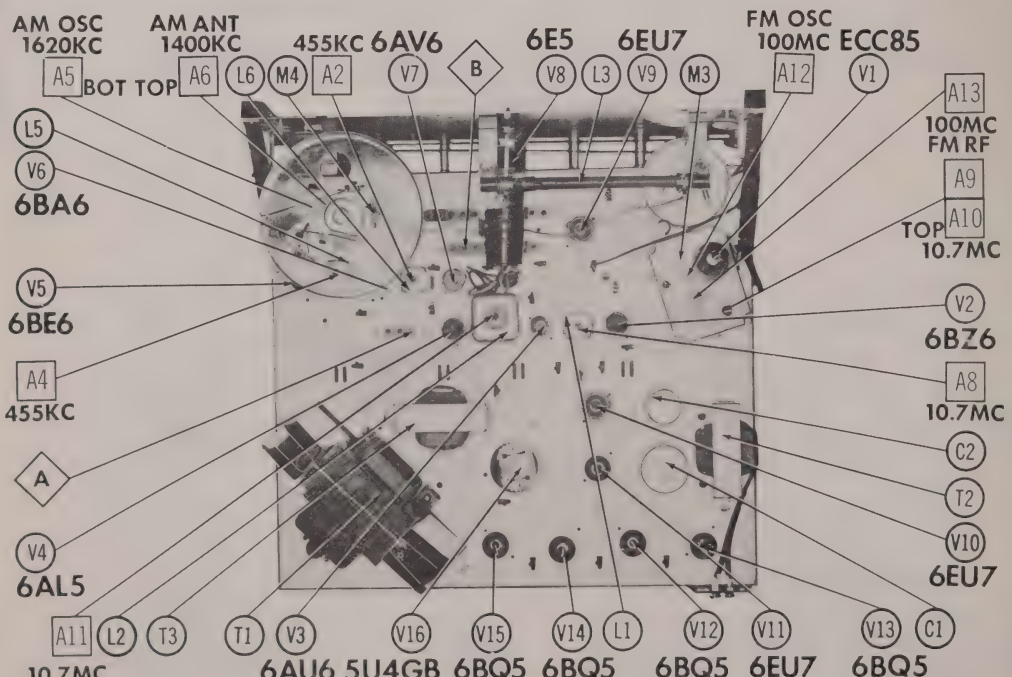
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KN489

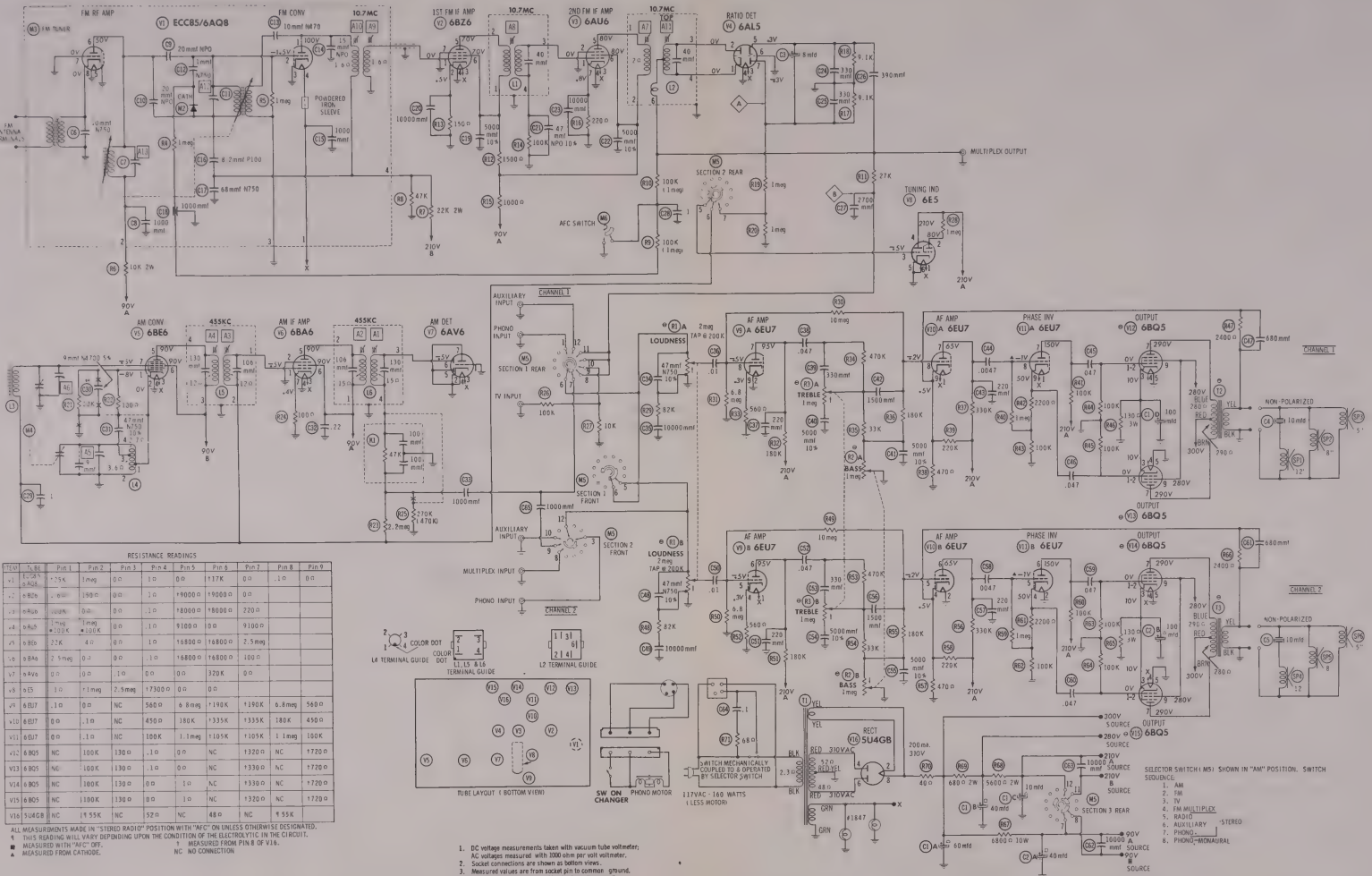
SET 534 FOLDER 4



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS-TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
v1	6BZ6 or 6AG5	1.25K	1meg	0Ω	1Ω	0Ω	117K	0Ω	.1Ω	0Ω
v2	6BZ6	0Ω	190Ω	0Ω	1Ω	+9000Ω	+9000Ω	0Ω		
v3	6AU6	200K	0Ω	0Ω	1Ω	+8000Ω	+8000Ω	220Ω		
v4	6AL5	1meg +100K	1meg +100K	0Ω	1Ω	9100Ω	0Ω	9100Ω		
v5	6BE6	22K	4Ω	0Ω	1Ω	+6800Ω	+6800Ω	2.5meg		
v6	6BA6	2.5meg	0Ω	0Ω	1Ω	+6800Ω	+6800Ω	100Ω		
v7	6AV6	0Ω	0Ω	1Ω	0Ω	0Ω	320K	0Ω		
v8	6E5	1Ω	+1meg	2.5meg	+7300Ω	0Ω	0Ω			
v9	6EU7	.1Ω	0Ω	NC	560Ω	6.8meg	+190K	+190K	6.8meg	560Ω
v10	6EU7	0Ω	.1Ω	NC	450Ω	180K	+335K	+335K	180K	450Ω
v11	6EU7	0Ω	.1Ω	NC	100K	1.1meg	+105K	+105K	1.1meg	100K
v12	6BQ5	NC	100K	130Ω	.1Ω	0Ω	NC	+320Ω	NC	+720Ω
v13	6BQ5	NC	100K	130Ω	.1Ω	0Ω	NC	+330Ω	NC	+720Ω
v14	6BQ5	NC	100K	130Ω	0Ω	.1Ω	NC	+330Ω	NC	+720Ω
v15	6BQ5	NC	100K	130Ω	0Ω	.1Ω	NC	+320Ω	NC	+720Ω
v16	5U4GB	NC	19.5K	NC	52Ω	NC	48Ω	NC	9.5K	

ALL MEASURMENTS MADE IN "STEREO RADIO" POSITION WITH "AFC" ON UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
■ MEASURED WITH "AFC" OFF.
▲ MEASURED FROM CATHODE.
† MEASURED FROM PIN 8 OF V16.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

SELECTOR SWITCH (M5) SHOWN IN "AM" POSITION. SWITCH SEQUENCE:
1. AM
2. FM
3. TV
4. FM MULTIPLEX
5. RADIO
6. AUXILIARY
7. PHONO - STEREO
8. PHONO - MONAURAL

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1961

CURTIS MATHES MODELS 3016A, 3116A, 3216A, 3316A (Ch. 16A)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4 and A8	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A6	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A7, A11	GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722, 9150, 9298 WALSCO #2516, 2518, 2519
A9, A10	GENERAL CEMENT #9440
A12, A13	GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291 WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of AM tuning gang. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	Loop	1400KC	1400KC Signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Set pointer to 1400 KC.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Across FM antenna terminals.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
5.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A11	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 150Ω in each lead.	100MC	(FM) 100MC	DC probe to point Ⓐ. Common to chassis.	A12, A13	Adjust for maximum deflection.

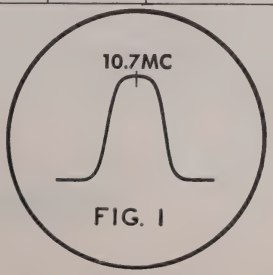


FIG. 1

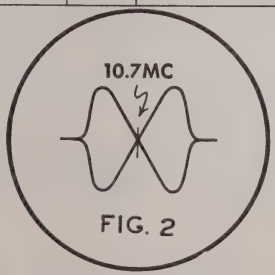
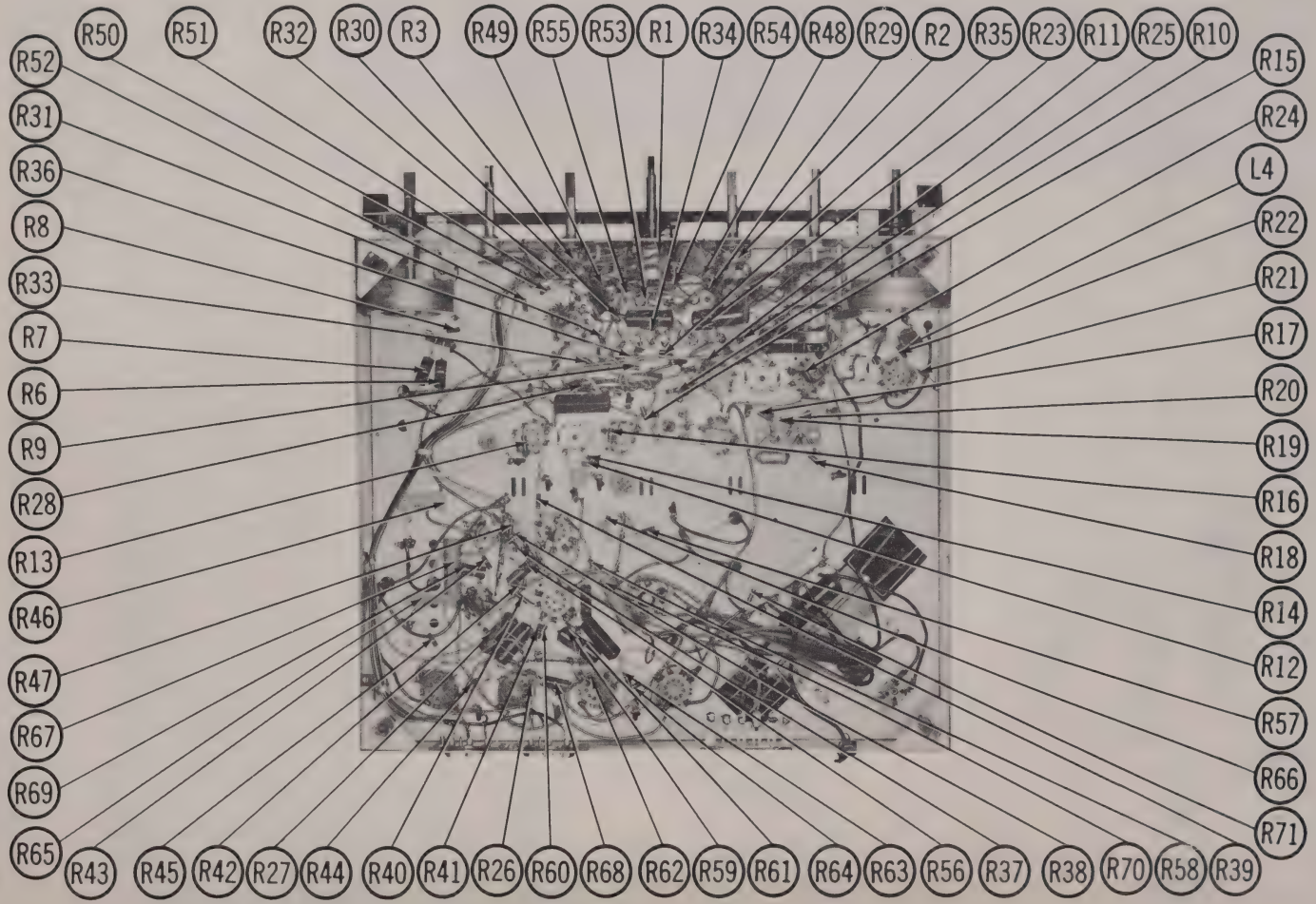


FIG. 2



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	FM RF Amp. -FM Conv.	ECC85/6AQ8
V2	1st FM IF Amplifier	6BZ6
V3	2nd FM IF Amplifier	6AU6
V4	Ratio Detector	6AL5
V5	AM Converter	6BE6
V6	AM IF Amplifier	6BA6
V7	AM Detector	6AV6
V8	Tuning Indicator	6E5
V9	Channel 1 AF Amp. - Channel 2 AF Amp.	6EU7
V10	Channel 1 AF Amp. - Channel 2 AF Amp.	6EU7
V11	Channel 1 Phase Inv. - Channel 2 Phase Inv.	6EU7
V12	Channel 1 Output	6BQ5 (EL84) *
V13	Channel 1 Output	6BQ5 (EL84) *
V14	Channel 2 Output	6BQ5 (EL84) *
V15	Channel 2 Output	6BQ5 (EL84) *
V16	Rectifier	5U4GB

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▰60	400	4A4	AFHS4-57-93	D0477.5	FP454.8	TMT-3679 TD-50-450	TVLS-4670.8*	
B	■40	400							
C	▲10	400							
D	100	25							
C2A	■40	400	4A13	AFH2-86-45	B0623	FP229.55	TMD-2450	TVL-2709	
B	▲100	25					MLV10-25	TE-1203.5	
C3	8	25	4A18	PTT-25008	NLW8-25	TT25X8		TVANS-1204.1*	
C4	10	25NP		PRS7315	BBR10-150	TCN5010		TVANS-1204.1*	
C5	10	25NP		PRS7315	BBR10-150	TCN5010			

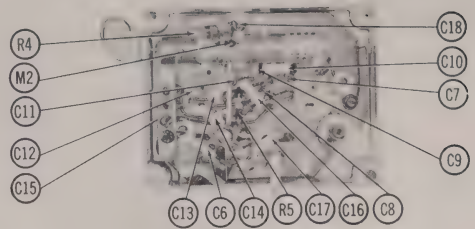
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10 N750		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C7								
C8	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C10	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C11								
C12	1 N750					*		
C13	10 N470		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C14	15 NPO		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	1000					*		
C16	8.2 P100							
C17	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C18	1000		EF-001	MFT-1000		CCF-102	CT280A	
C19	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C20	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-SI0
C21	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C22	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C23	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-SI0
C24	330		DI-330	DD-331	LI0T33	CCD-331	B-333	10TS-T33
C25	330		DI-330	DD-331	LI0T33	CCD-331	B-333	10TS-T33
C26	390		DI-390	DD-391	LI0T39	CCD-391	B-390	10TS-T39
C27	2700		DI-2700	DD-272	BYA10D27	CCD-272	B-227	10TS-D27
C28	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C29	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C30	9 N4700 5%	Note 1				*		
C31	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C33	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C34	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C35	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C36	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C37	220		DI-220	DD-221	LI0T22	CCD-221	B-322	10TS-T22
C38	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C39	330		DI-330	DD-331	LI0T33	CCD-331	B-333	10TS-T33

FM RF SUBCHASSIS



FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C40	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C41	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C42	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C43	220		DI-220	DD-221	LI0T22	CCD-221	B-322	10TS-T22
C44	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C45	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C46	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C47	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C48	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C49	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C50	.01 400V		P488N-01	D6-103	CUB4S1	4DP-3-104	GEM-411	4TM-S10
C51	220		DI-220	DD-221	LI0T22	CCD-221	B-322	10TS-T22
C52	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C53	330		DI-330	DD-331	LI0T33	CCD-331	B-333	10TS-T33
C54	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C55	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C56	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C57	220		DI-220	DD-221	LI0T22	CCD-221	B-322	10TS-T22
C58	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C59	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C60	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C61	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C62	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C63	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C64	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C65	1000		BPD-001	DD-102	BYA1001	CCD-102	B-210	5HK-D10

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	2A34 ①					Loudness, Channel 2
	200K Tap							
B	2meg	½						Loudness, Channel 1
	200K Tap							
R2A	1meg	½	2A39 ②	B-70	AD47-1meg-Z		FA16A	Bass, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Bass, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	
R3A	1meg	½	2A39 ②	B-70	AD47-1meg-Z		FA16A	Treble, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Treble, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	

① Some versions may use dual 1meg (Part #2A38).
② Some versions may use Part #2A6. Use replacements listed above.

CURTIS MATHES MODELS 3016A, 3116A, 3216A, 3316A (Ch. 16A)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1meg			
R5	1meg			
R6	10K 2W			
R7	22K 2W			
R8	47K			
R9	100K			(1meg) *
R10	100K			(1meg) *
R11	27K			
R12	1500Ω			
R13	150Ω			
R14	100K			
R15	1000Ω			
R16	220Ω			
R17	9100Ω			
R18	9100Ω			
R19	1meg			
R20	1meg			
R21	22K			
R22	100Ω			
R23	2.2meg			
R24	100Ω			
R25	270K			(470K) *
R26	100K			
R27	10K			
R28	1meg			
R29	82K			
R30	10meg			
R31	6.8meg			
R32	180K			
R33	560Ω			
R34	470K			
R35	33K			
R36	180K			
R37	330K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R38	470Ω			
R39	220K			
R40	1meg			
R41	100K			
R42	2200Ω			
R43	100K			
R44	100K			
R45	100K			
R46	130Ω 3W	PW5-130	5W-SQ-130	
R47	2400Ω			
R48	82K			
R49	10meg			
R50	6.8meg			
R51	180K			
R52	560Ω			
R53	470K			
R54	33K			
R55	180K			
R56	330K			
R57	470Ω			
R58	220K			
R59	1meg			
R60	100K			
R61	2200Ω			
R62	100K			
R63	100K			
R64	100K			
R65	130Ω 3W	PW5-130	5W-SQ-130	
R66	2400Ω			
R67	6800Ω 10W			
R68	5600Ω 2W			
R69	680Ω 2W			
R70	40Ω			
R71	68Ω			

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	2nd FM IF	1A10	FM-254	1463	RTC-8599	T633	
L2	Ratio Detector	1A9	FM-252	1465	RTC-8600	T635	
L3	Loopstick	1A35	BC-418	705-A		T532	
L4	AM Osc.	1A2					
L5	1st AM IF	1A4	BC-352	12-C1	RTC-8632	T607	
L6	2nd AM IF	1A5	BC-353	12-C2	RTC-8633	T608	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ 1.4A	620VCT @ .200A DC	5V @ 3A	12A11				R-75BA	
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 6.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4500Ω CT	3-4Ω	10A3-A ①	A-2905	A-3880	24S42	S-69Z	① Alternate Part #10A3-2
T3	4500Ω CT	3-4Ω	10A3-1 ②	A-2905	A-3880	24S42	S-69Z	② Alternate Part #10A3-3

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA Curtis Mathes PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3-4Ω	12JB-38A	12A6A	
SP2	8"	PM	6-8Ω	8EV-39	8A1Z8.4	
SP3	5"	PM	6-8Ω	5CM-98	5A15Z7.8	
SP4	12"	PM	3-4Ω	12JB-38A	12A6A	
SP5	8"	PM	6-8Ω	8EV-39	8A1Z8.4	
SP6	5"	PM	6-8Ω	5CM-98	5A15Z7.8	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Curtis Mathes PART No.	REPLACEMENT DATA
K1	AM Diode RF Filter	100mmf, 100mmf, 47K		Aerovox PA-97 Centralab PC-50 Sprague D-1

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA Curtis Mathes PART No. CARTRIDGE	NEEDLE*	ASTATIC PART No. CARTRIDGE	NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	NEEDLE*	SONOTONE PART No. CARTRIDGE	NEEDLE*	NOTES
M1			13TB	Not Req.	26S	S1-1 * & S3-3 *	9T-S	N-8TA-S *	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Curtis Mathes PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2						AFC (Part of FM Tuner)

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M3	FM Tuner	7A4	Complete
M4	Tuning Cap	3A9	AM, 2 Gang (Ant. 35—550mmf, Osc. 16—117mmf)
M5	Switch	6A23	Function Selector (Rotary Type, Includes Off-On)
M6	Switch	6A17	AFC (Rotary Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	2B13	
Knob	11B4	Tuning, Function Selector
Knob	11B6-1	Level, Outside
Knob	11B7-1	Level, Inside
Knob	11B3	Bass, Treble, AFC

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

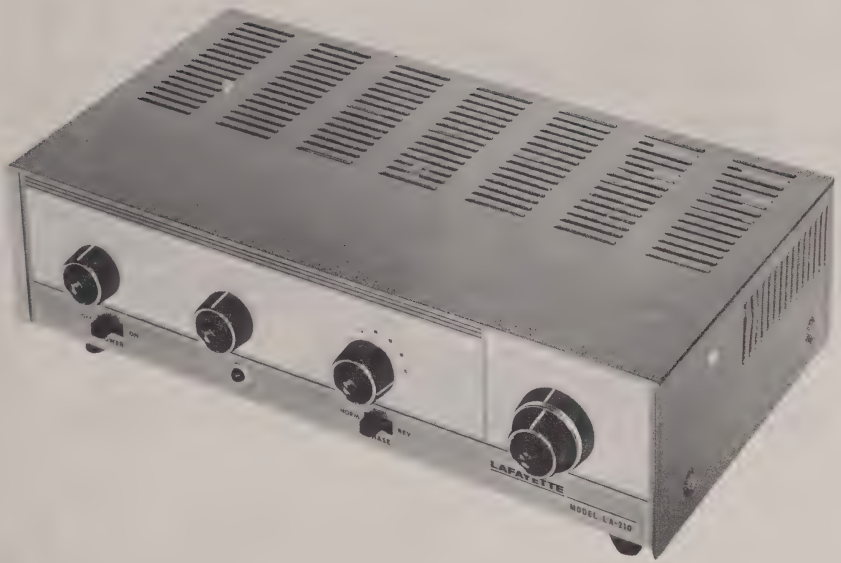
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

LAFAYETTE MODEL LA-210

LAFAYETTE MODEL LA-210



LAFAYETTE MODEL LA-210

TRADE NAME	LaFayette Model LA-210
SUPPLIER	LaFayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.
TYPE SET	AC Operated 5 Tube Stereo Amplifier
POWER SUPPLY	105-125 Volts AC, 50-60 Cycles RATING 90 Watts, .9 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KV484

SET 534 FOLDER 5

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Channel A AF Amp.	12AX7
V2	Channel A Output	6BQ5
V3	Channel B AF Amp.	12AX7
V4	Channel B Output	6BQ5
V5	Rectifier	6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA LAFAYETTE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350		AFH2-41-10	B0331	FP227.5	TMD-2420	TVL-2637	
B	100	350							
C2	20	300		PRS1735	BR2035	TC65	TD-20-350	TVA-1608	
C3	20	300		PRS1735	BR2035	TC65	TD-20-350	TVA-1608	
C4	20	300		PRS1735	BR2035	TC65	TD-20-350	TVA-1608	

FIXED CAPACITORS

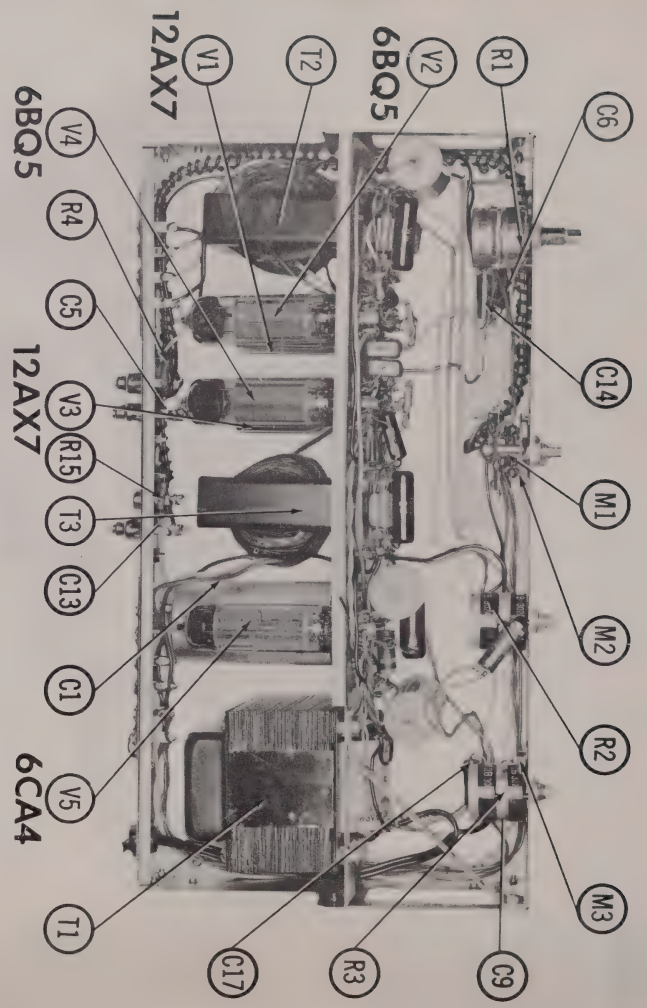
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C7	1000 10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-21
C8	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C9	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C10	250 10%		1469-00025	TCZ-240	22R5T22	CM-19B-251K	MCB240	MS-325
C11	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C12	1000 10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-21
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C15	1000 10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-21
C16	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C17	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C18	250 10%		1469-00025	TCZ-240	22R5T22	CM-19B-251K	MCB240	MS-325
C19	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C20	1000 10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-21

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½						Volume, Channel A
B	1meg	½						Balance, Channel B
R2A	1meg	½		AB-69				Treble, Channel A
B	1meg	½		SR-69				Treble, Channel B
C	Shaft			AK-29				
R3A	50K	½		AB-32				Bass, Channel A
B	50K	½		SR-32				Bass, Channel B
C	Shaft			AK-29				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1meg			
R5	500K			
R6	250K			
R7	30K			
R8	3000Ω			
R9	500K			
R10	250K			
R11	3000Ω			
R12	20K			
R13	500K			
R14	150Ω 3W	PW5-150	5W-SQ-150	
R15	1meg			
R16	500K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R17	250K			
R18	30K			
R19	3000Ω			
R20	500K			
R21	250K			
R22	3000Ω			
R23	20K			
R24	500K			
R25	150Ω 3W	PW5-150	5W-SQ-150	
R26	5000Ω 2W			
R27	100Ω 5W	PW5-100	5W-SQ-100	
R28	500K			

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .9A Tap @ 100V (Not Used)	540VCT @ .120A DC	6.3VCT @ 3A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5400Ω	16Ω Tap@ 8Ω, 4Ω						
T3	5400Ω	16Ω Tap@ 8Ω, 4Ω						

MISCELLANEOUS

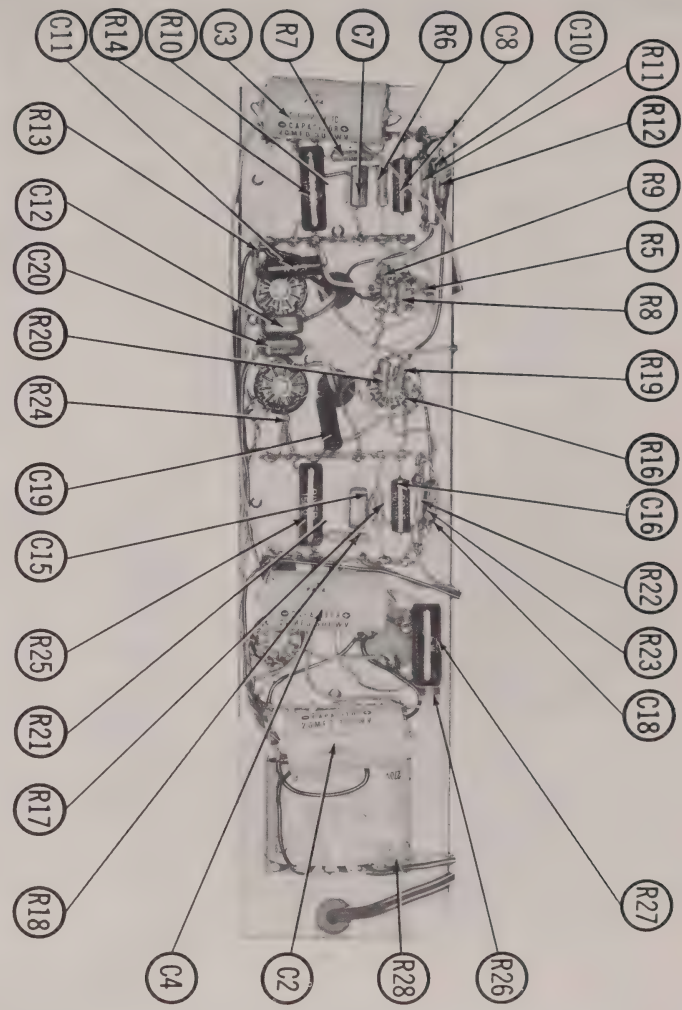
ITEM No.	PART NAME	LAFAYETTE PART No.	NOTES
M1	Switch		Function Selector (Rotary Wafer Type)
M2	Switch		Phase (DPDT Slide Type)
M3	Switch		Power Off-On (SPDT Slide Type)

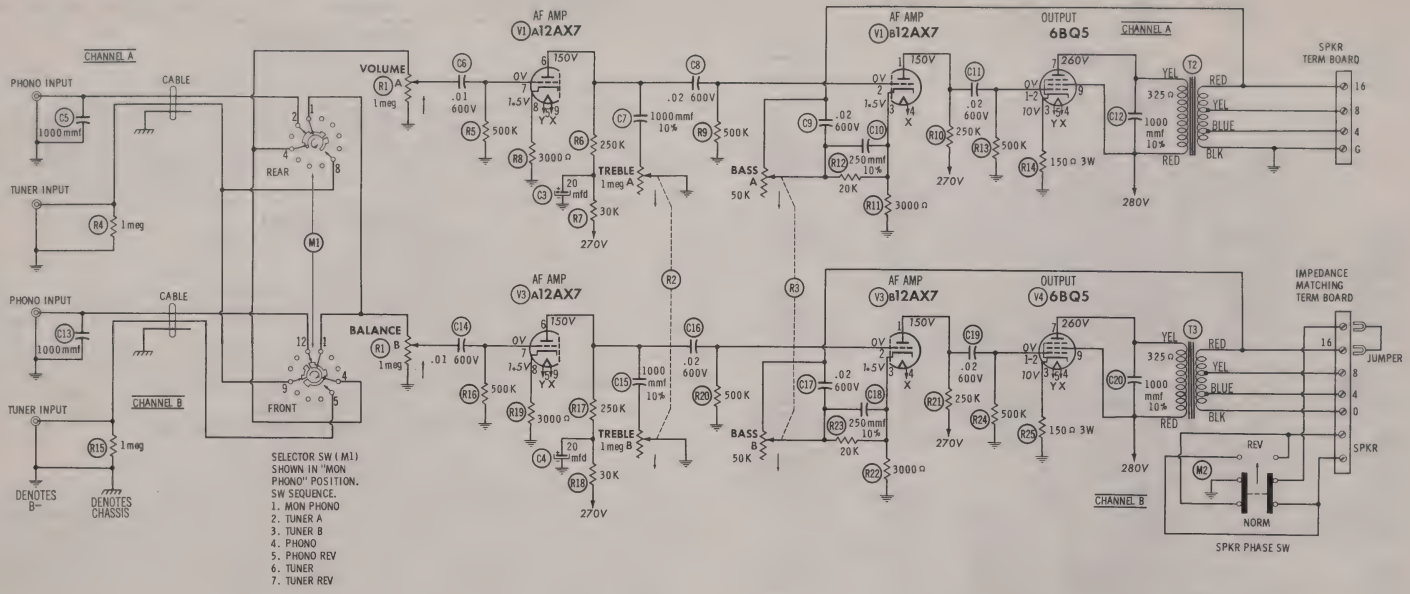
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW

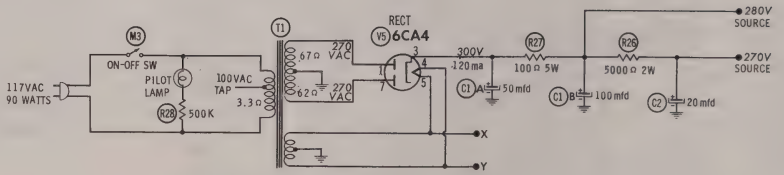




RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†250K	500K	3000Ω	.1Ω	.1Ω	†285K	500K	3000Ω	.1Ω
V2	6BQ5	NC	500K	150Ω	.1Ω	.1Ω	NC	†425Ω	NC	†100Ω
V3	12AX7	†250K	500K	3000Ω	.1Ω	.1Ω	†285K	500K	3000Ω	.1Ω
V4	6BQ5	NC	500K	150Ω	.1Ω	.1Ω	NC	†425Ω	NC	†100Ω
V5	6CA4	67Ω	NC	¶30K	.1Ω	.1Ω	NC	62Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V5.
NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

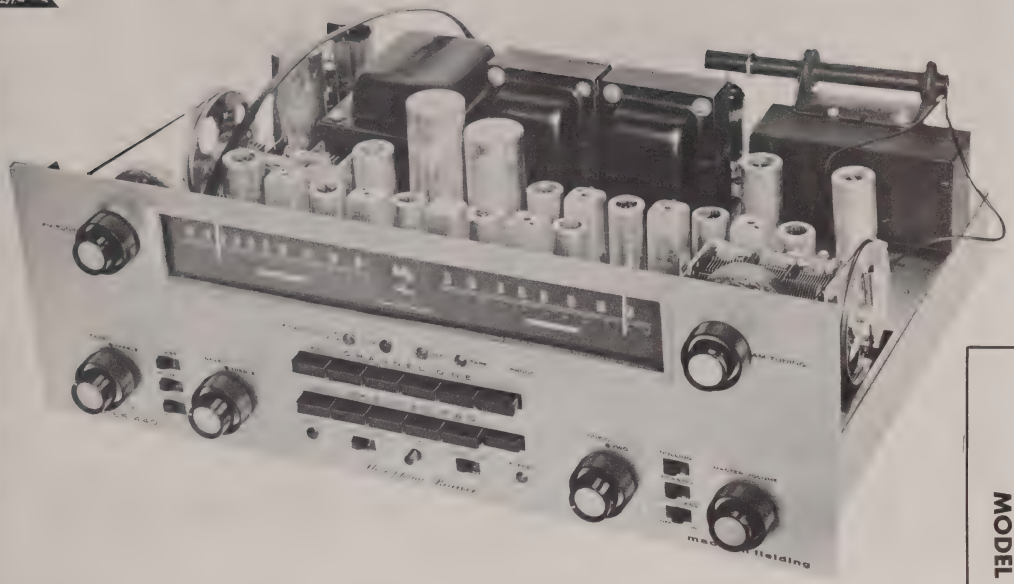
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1961

LAFAYETTE MODEL LA-210

PHOTOFACT® Folder

**MADISON FIELDING
MODEL SERIES 440**

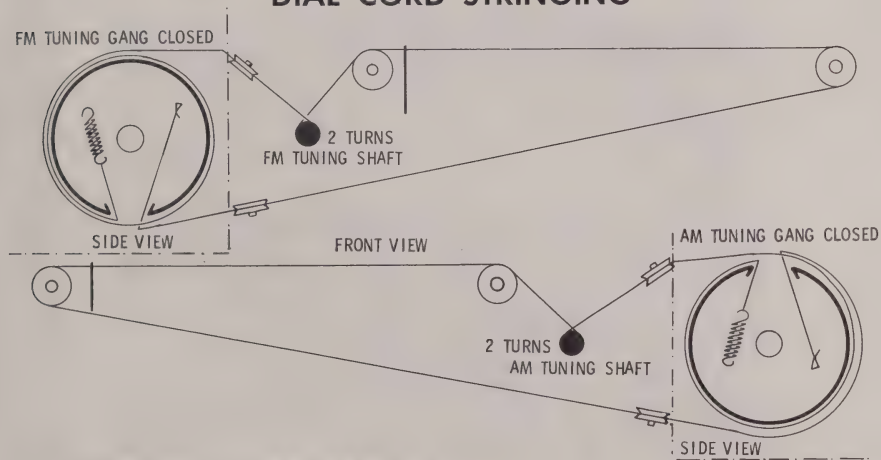


MADISON FIELDING
MODEL SERIES 440

MADISON FIELDING
MODEL SERIES 440

TRADE NAME	Madison Fielding Model Series 440		
MANUFACTURER	Crosby Electronics, Inc., Subsidiary of Crosby-Teletronics Corp., 125 Eizeen Way, Syosset, L.I., N.Y.		
TYPE SET	AC Operated 23 Tube FM-AM Receiver With Stereo Amplifier		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	170 Watts, 1.6 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	530 – 1640KC	FREQ. MOD.	88 – 108MC

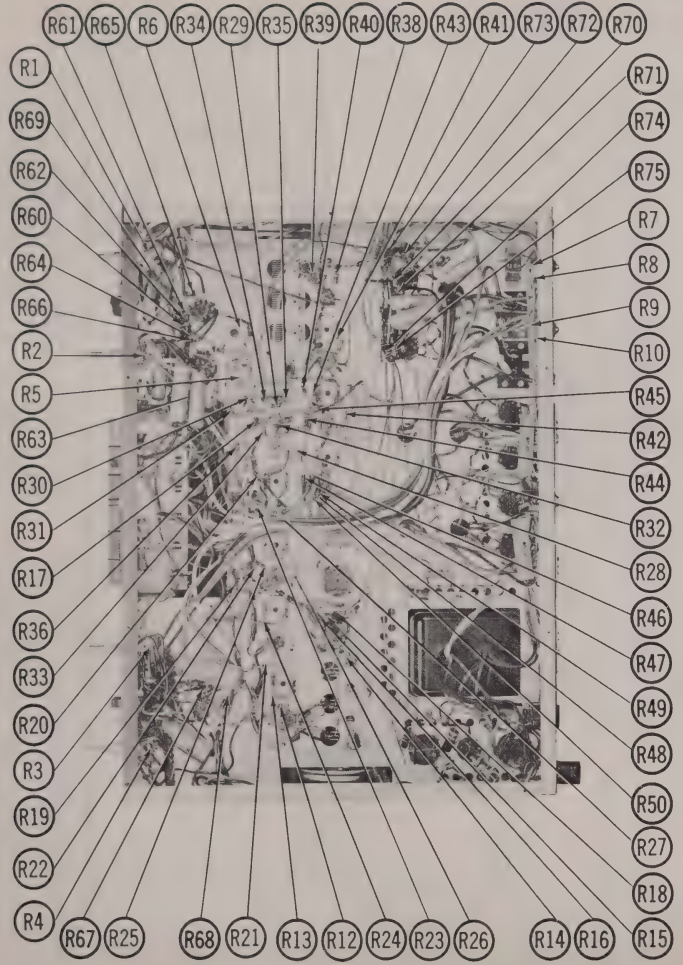
DIAL CORD STRINGING



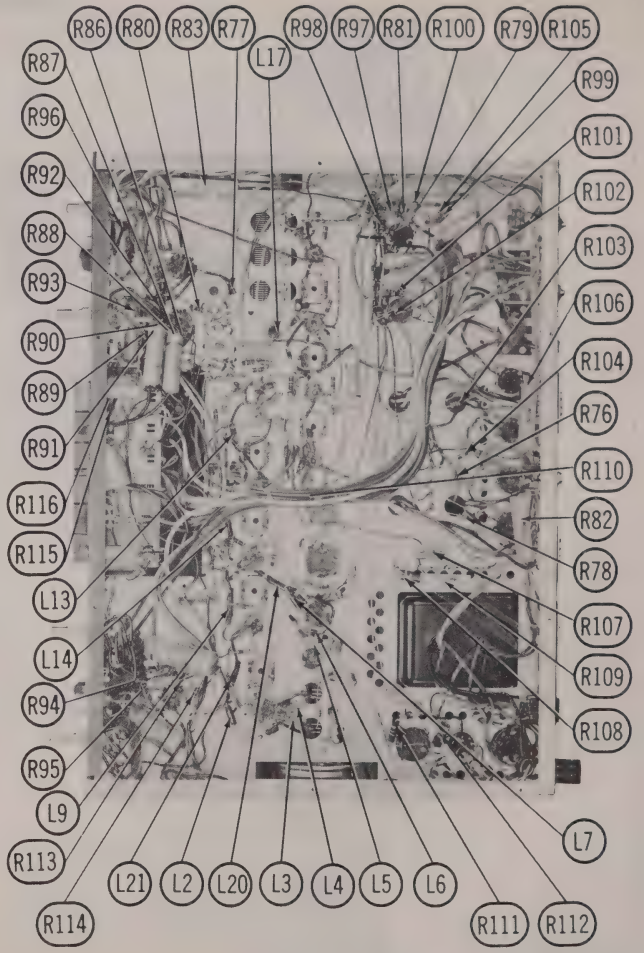
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KK492

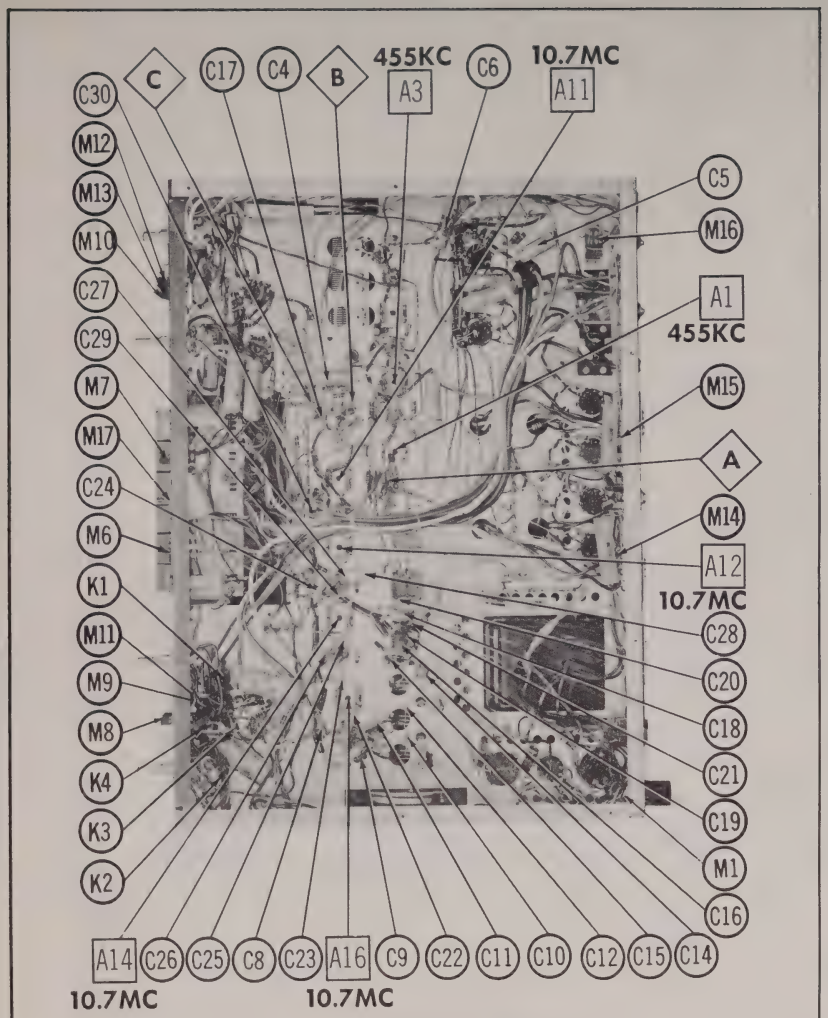
the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



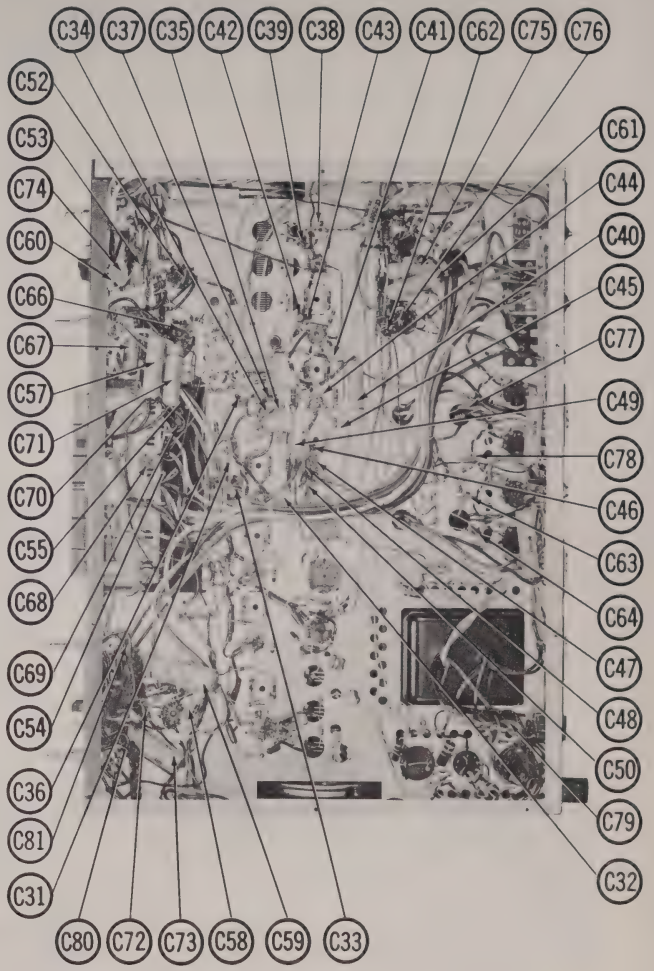
CHASSIS BOTTOM VIEW-RESISTOR IDENT.



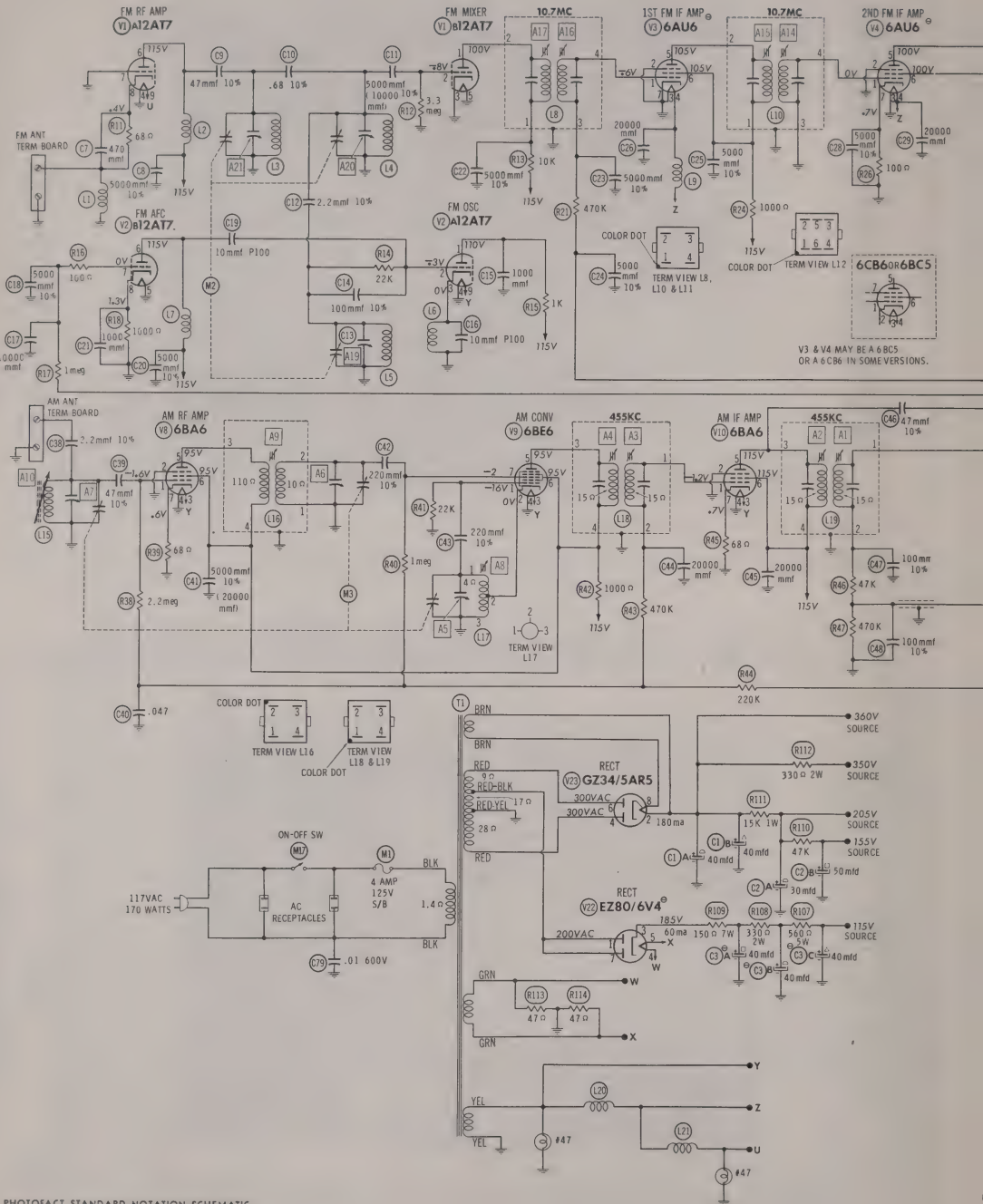
CHASSIS BOTTOM VIEW
-RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW-
ALIGNMENT, CAPACITOR & MISC. IDENT .

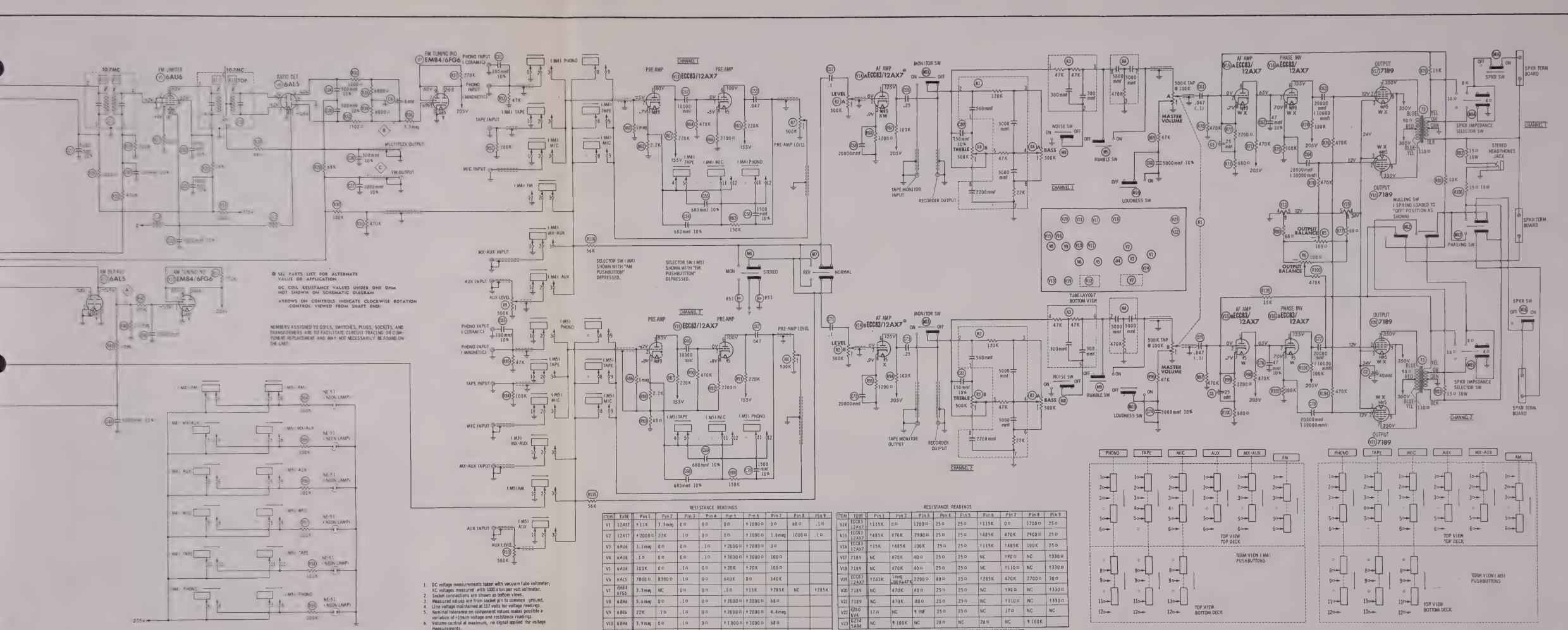


CHASSIS BOTTOM VIEW-CAPACITOR IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1961



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION -CONTROL VIEWED FROM SHAFT END.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†11K	3.3meg	0Ω	0Ω	0Ω	†1000Ω	0Ω	68Ω	.1Ω
V2	12AT7	†2000Ω	22K	.1Ω	0Ω	0Ω	†1000Ω	1.6meg	1000Ω	.1Ω
V3	6AU6	1.1meg	0Ω	0Ω	.1Ω	†2000Ω	†2000Ω	0Ω		
V4	6AU6	.1Ω	0Ω	0Ω	.1Ω	†3000Ω	†3000Ω	100Ω		
V5	6AU6	100K	0Ω	.1Ω	0Ω	†20K	†20K	100Ω		
V6	6AL5	7800Ω	8300Ω	.1Ω	0Ω	640K	0Ω	640K		
V7	EM84 6FG6	3.3meg	NC	0Ω	0Ω	.1Ω	†15K	†285K	NC	†285K
V8	6BA6	5.6meg	0Ω	.1Ω	0Ω	†2000Ω	†2000Ω	68Ω		
V9	6BE6	22K	.1Ω	.1Ω	0Ω	†2000Ω	†2000Ω	4.4meg		
V10	6BA6	3.9meg	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	68Ω		
V11	6AL5	0Ω	520K	.1Ω	0Ω	0Ω	0Ω	2.2meg		
V12	EM84 6FG6	3.2meg	NC	0Ω	0Ω	.1Ω	†15K	†285K	NC	†285K
V13	ECC83 12AX7	†285K	1meg 100K≠47K	2200Ω	0Ω	25Ω	†285K	470K	2700Ω	12Ω

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V14	ECC83 12AX7	†115K	0Ω	1200Ω	25Ω	25Ω	†115K	0Ω	1200Ω	25Ω
V15	ECC83 12AX7	†485K	470K	2900Ω	25Ω	25Ω	†485K	470K	2900Ω	25Ω
V16	ECC83 12AX7	†15K	†485K	100K	25Ω	25Ω	†115K	†485K	100K	25Ω
V17	7189	NC	470K	40Ω	25Ω	25Ω	NC	†90Ω	NC	†330Ω
V18	7189	NC	470K	40Ω	25Ω	25Ω	NC	†110Ω	NC	†330Ω
V19	ECC83 12AX7	†285K	1meg 100K≠47K	2200Ω	40Ω	25Ω	†285K	470K	2700Ω	30Ω
V20	7189	NC	470K	40Ω	25Ω	25Ω	NC	†90Ω	NC	†330Ω
V21	7189	NC	470K	40Ω	25Ω	25Ω	NC	†110Ω	NC	†330Ω
V22	GZ30 6V4	17Ω	NC	¶ INF	25Ω	25Ω	NC	17Ω	NC	NC
V23	GZ34 5AR4	NC	¶ 100K	NC	28Ω	NC	26Ω	NC	¶ 100K	

ALL MEASUREMENTS MADE IN "STEREO AM-FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V23. ▲ MEASURED IN "TAPE" POSITION.
† MEASURED FROM PIN 3 OF V22. ■ MEASURED IN "PHONO" POSITION.
NC NO CONNECTION

MADISON FIELDING MODEL SERIES 440

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 Thru A4, A9, A11 Thru A18	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A6, A7, A19, A20, A21	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A8	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ 30% AM)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1400KC	1400KC	"	A5, A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A8, A9, A10	Adjust for maximum deflection. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A11, A12, A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C4. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C4.
5.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 150Ω in each lead.	105MC (Unmod.)	(FM) 105MC	DC probe to point Ⓑ. Common to chassis.	A19, A20 A21	Adjust for maximum deflection.
7.	"	90MC	90MC	"	L5, L4, L3	Adjust for maximum deflection by expanding or compressing coil turns.

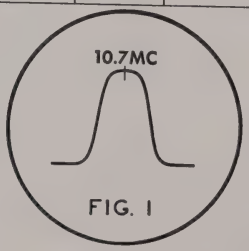


FIG. 1

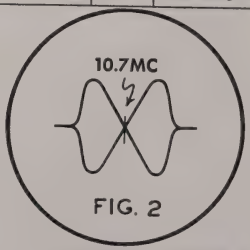
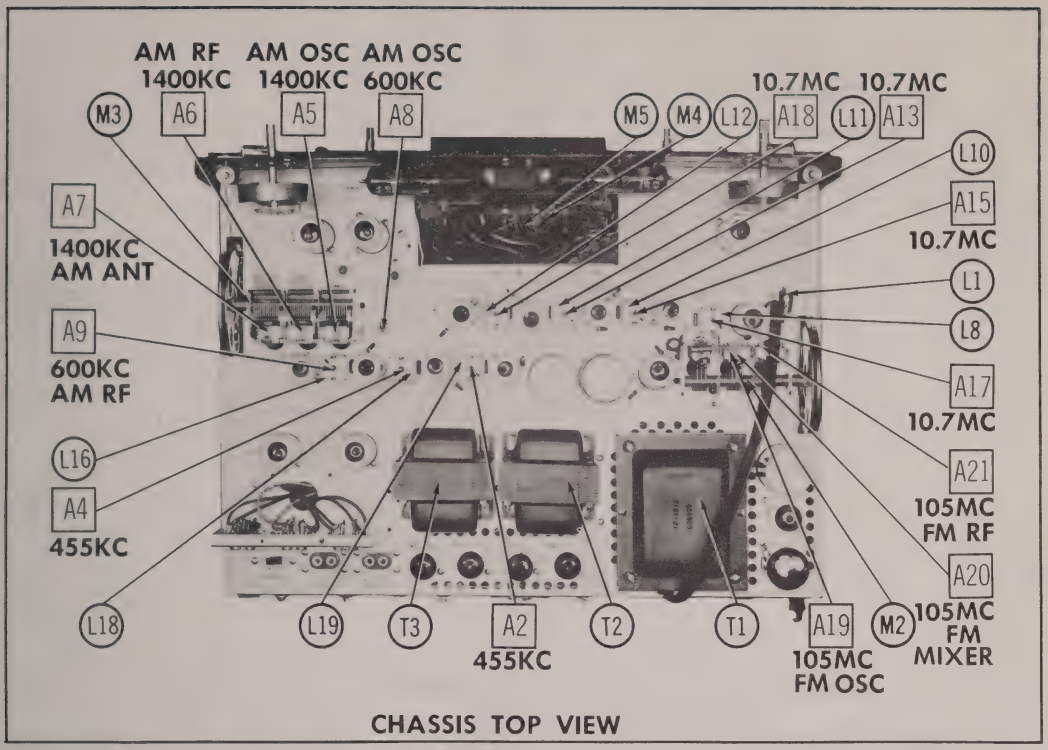
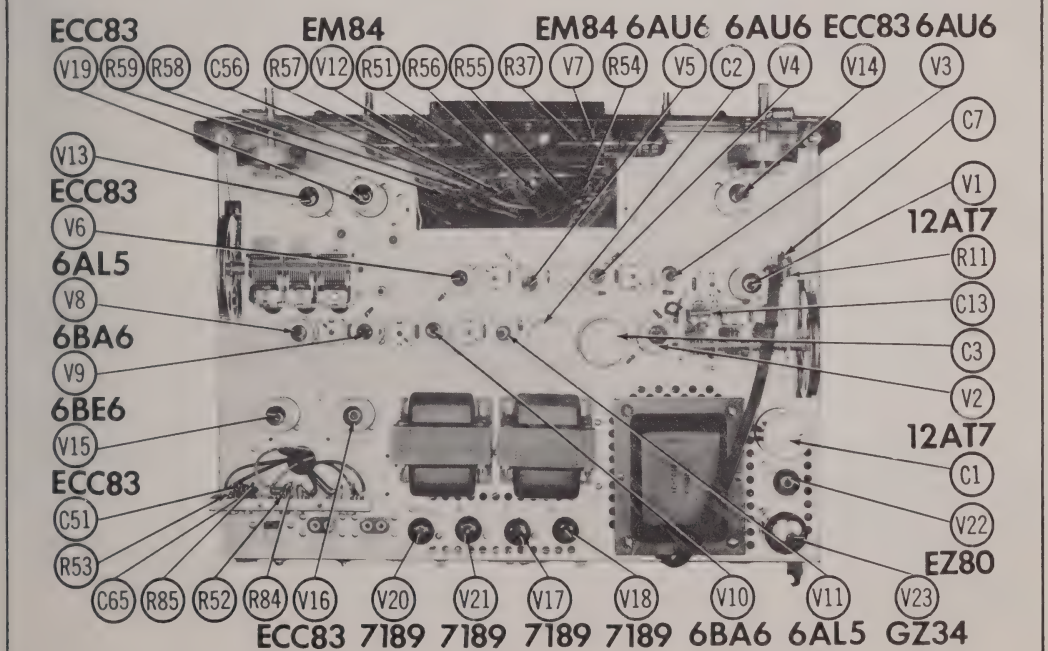


FIG. 2

SET 534 FOLDER 6



CHASSIS TOP VIEW



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	12AT7
V2	FM Osc. -AFC	12AT7
V3	1st FM IF Amplifier	6AU6
V4	2nd FM IF Amplifier	6AU6
V5	FM Limiter	6AU6
V6	Ratio Detector	6AL5
V7	FM Tuning Indicator	EM84/6FG6
V8	AM RF Amplifier	6BA6
V9	AM Converter	6BE6
V10	AM IF Amplifier	6BA6
V11	AM Det. - AVC	6AL5
V12	AM Tuning Indicator	EM84/6FG6
V13	Channel 1 Preamp.	ECC83/12AX7
V14	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83/12AX7(12AU7)*
V15	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83/12AX7
V16	Channel 1 Phase Inv. - Channel 2 Phase Inv.	ECC83/12AX7
V17	Channel 1 Output	7189
V18	Channel 1 Output	7189
V19	Channel 2 Preamp.	ECC83/12AX7
V20	Channel 2 Output	7189
V21	Channel 2 Output	7189
V22	Rectifier	EZ80/6V4 (EZ81) *
V23	Rectifier	GZ34/5AR4

* Used in some versions. Replace with same type.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Madison Fielding PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	CE-4020	AFH2-57	B0450	FP238	TMD-2650	TVL-2764	
B	▲40	450							
C2A	▲30	450	CE-305040	AFH3-147		FP369.1	TMT-3751	TVL-3788	
B	■50	400							
C	▲40	50							
C3A	■40	400	CE-3X404	AFH3-44		FP377.1	TMT-3748	TVL-3787	Note 1
B	▲40	450							Note 1
C	▲40	350							
C4	8	50	CE-8050	PRS1405	BBR8-150	TC41	TD-8-150	TVA-1405	
C5	25	3	CE-25003	SRE3V25	BBR25-3	TT3X25	TD-25-25	TVA-1205	
C6	25	3	CE-25003	SRE3V25	BBR25-3	TT3X25	TD-25-25	TVA-1205	

Note 1. Some versions may use 40-40-20mfd in this application (Part #CE-3X4023).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C8	5000 10%	*	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C9	47 10%		NPO-SI 47	TCZ-47	L10Q47	CCD-470	GP447	10TS-Q47
C10	.68 10%		NPO-SI .68	TCZ-R68				
C11	5000 10%	(10000) †	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C12	2.2 10%	#CV-1004	NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C13								
C14	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	10 P100					*		
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	
C19	10 P100					*		
C20	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C21	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C23	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C24	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C25	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C26	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C27	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C28	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C29	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C30	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C31	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C32	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C33	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C34	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T30
C35	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T30
C36	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T30
C37	1000 10%			DD-102	5R5D1	CCD-102	GP210	10TS-D10
C38	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C39	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C40	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C41	5000 10%	(20000) †	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C42	220 10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C43	220 10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C44	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C46	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C47	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C48	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C49	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C50	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C51	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	680 10%			D6-681	5R5T68	CCD-681	GP368	10TS-T68
C55	680 10%			D6-681	5R5T68	CCD-681	GP368	10TS-T68
C56	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C57	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C58	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C59	.25 400V		P488N-25		CUB4P25	4DP-5-254	GEM-4025	4TM-P25
C60	5000 10%		DI-5000		PM-6D5	CCD-502	JL-250	10TS-D50
C61	.047 400V	(.1) †	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C62	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C63	20000	(10000) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C64	20000	(10000) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C65	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C66	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C67	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C68	680 10%			D6-681	5R5T68	CCD-681	GP368	10TS-T68
C69	680 10%			D6-681	5R5T68	CCD-681	GP368	10TS-T68
C70	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C71	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C72	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C73	.25 400V		P488N-25		CUB4P25	4DP-5-254	GEM-4025	4TM-P25
C74	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C75	.047 400V	(.1) †	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4125	4TM-S47
C76	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C77	20000	(10000) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C78	20000	(10000) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C79	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C80	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15
C81	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15

† Alternate Value.
# Madison Fielding Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Madison Fielding PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	RV-5056	BT-66			FA55T15	Master Volume, Channel 1
B	100K Tap 500K	½		STR-66			RU55T15	Master Volume, Channel 2
C	100K Tap Shaft			Not Req.			CS3500	
R2A	500K	½	RV-5055	F1-40		† QJ-1535R	■ UE4200	Level, Channel 1
B	500K	½		R2-40				Level, Channel 2
R3A	500K	½	RV-5053	F1-41		‡ QJ-1534R	▲ UE4215	Bass, Channel 2
B	500K	½		R2-41				Treble, Channel 2
R4A	500K	½	RV-5053	F1-41		‡ QJ-1534R	▲ UE4215	Bass, Channel 1
B	500K	½		R2-41				Treble, Channel 1
R5A	100Ω	½	RW-1011	AB-1		Bl1-084	U-1	Output Balance, Channel 1
B	Shaft			AK-1		SK 2	Not Req.	
R6A	100Ω	½	RW-1011	AB-1		Bl1-084	U-1	Output Balance, Channel 2
B	Shaft			AK-1		SK 2	Not Req.	
R7	500K	1/4	RV-5041	JP-504	48M-500K-S		MLCN55L	Level, Preamp., Channel 1
R8	500K	1/4	RV-5041	JP-504	48M-500K-S		MLCN55L	Level, Preamp., Channel 2
R9	500K	1/4	RV-5041	JP-504	48M-500K-S		MLCN55L	Level, Amp., Channel 1
R10	500K	1/4	RV-5041	JP-504	48M-500K-S		MLCN55L	Level, Amp., Channel 2

† "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts:
(Not available as a factory assembled unit). Bl1-133, P13-022 (Panel)
Bl1-133, Rl-100 (Rear)

‡ "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts:
(Not available as a factory assembled unit). Bl3-133, P13-022 (Panel)
Bl3-133, Rl-100 (Rear)

■ "STA-LOC" Equivalent: FA55L, RU55L, OS625, ISl125.
▲ "STA-LOC" Equivalent: FA55A, RU55A, OS687, ISl062.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R11	68Ω				R34	6800Ω			
R12	3.3meg				R35	6800Ω			
R13	10K				R36	3.3meg			
R14	22K				R37	270K			
R15	1000Ω				R38	2.2meg			
R16	100Ω				R39	68Ω			
R17	1meg				R40	1meg			
R18	1000Ω				R41	22K			
R19	1000Ω				R42	1000Ω			
R20	18K				R43	470K			
R21	470K				R44	220K			
R22	470K				R45	68Ω			
R23	100K				R46	47K			
R24	1000Ω				R47	470K			
R25	1000Ω				R48	2.2meg			
R26	100Ω				R49	1meg			
R27	100Ω				R50	1meg			
R28	68Ω				R51	270K			
R29	68K				R52	100K			
R30	100K				R53	47K			
R31	470K				R54	100K			
R32	1500Ω				R55	100K			
R33	1000Ω				R56	100K			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R57	100K				R87	220K			
R58	100K				R88	2200Ω			
R59	100K				R89	150K			
R60	1meg				R90	470K			
R61	220K				R91	220K			
R62	2200Ω				R92	2700Ω			
R63	150K				R93	68Ω			
R64	470K				R94	100K			
R65	220K				R95	1200Ω			
R66	2700Ω				R96	47K			
R67	100K				R97	470K			
R68	1200Ω				R98	470K			
R69	47K				R99	2200Ω			
R70	470K				R100	680Ω			
R71	470K				R101	100K			
R72	2200Ω				R102	100K			
R73	680Ω				R103	470K			
R74	100K				R104	470K			
R75	100K				R105	15K			
R76	470K				R106	15Ω 10W	PW10-15	10W-SQ-15	
R77	68Ω				R107	560Ω 5W	PW5-560	5W-SQ-560	
R78	470K				R108	330Ω 2W			
R79	15K				R109	150Ω 7W	PW7-150	7W-SQ-150	
R80	68Ω				R110	47K			
R81	10K				R111	15K 1W			
R82	15Ω 10W	PW10-15	10W-SQ-15		R112	330Ω 2W			
R83	15Ω 10W	PW10-15	10W-SQ-15		R113	47Ω			
R84	100K				R114	47Ω			
R85	47K				R115	56K			
R86	1meg				R116	56K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Madison Fielding PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke (.47uh)			4588	RTC-8513	T958	
L2	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L3	FM RF	LR-1002-1					
L4	FM Mixer Grid	LR-1002-2					
L5	FM Osc.	LO-1004					
L6	RF Choke (1uh)		BC-561	4602	RTC-8515	T855	
L7	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L8	1st FM IF	TI-1001	FM-254	1463	RTC-8599	T633	
L9	Fil. Choke (1uh)	LC-1001	BC-561	4602	RTC-8515	T855	
L10	2nd FM IF	TI-1005	FM-254	1463	RTC-8599	T633	
L11	3rd FM IF	TI-1001	FM-254	1463	RTC-8599	T633	
L12	Ratio Detector	TI-1002	FM-255	1465	RTC-8600	T635	
L13	Fil. Choke (1uh)	LC-1001	BC-561	4602	RTC-8515	T855	
L14	Fil. Choke (1uh)	LC-1001	BC-561	4602	RTC-8515	T855	
L15	Loopstick	LA-1004-1	BC-419	705-A		T532	
L16	AM RF	TR-1001					
L17	AM Osc.	LO-1002	BC-393	69-OSC	RTC-8646	T512	
L18	1st AM IF	TI-1003	BC-352	12-C1	RTC-8632	T607	
L19	2nd AM IF	TI-1003	BC-353	12-C2	RTC-8633	T608	
L20	Fil. Choke (1uh)	LC-1001	BC-561	4602	RTC-8515	T855	
L21	Fil. Choke (1uh)	LC-1001	BC-561	4602	RTC-8515	T855	

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Madison Fielding PART No.	REPLACEMENT DATA
K1	Channel 1 Tone Comp.	560mmf, 2200mmf, (2) 5000mmf, 22K, 47K, 120K	PAC1208-180	
K2	Channel 2 Tone Comp.	560mmf, 2200mmf, (2) 5000mmf, 22K, 47K, 120K	PAC1208-180	
K3	Noise Sw. Comp.	(4) 300mmf, (4) 47K	PAC1208-181	
K4	Rumble Sw. Comp.	(4) 5000mmf, (2) 470K	PAC1208-150	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA: Madison Fielding PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC. 1	SEC. 2						
T1	117V ⓐ 1.6A	800VCT ⓐ .180A DC Tap ⓐ 200V ⓐ .060A DC	5V ⓐ 1.9A	TP-1018					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ⓐ 4.9A	6.3V ⓐ 4A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA: Madison Fielding PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.						
T2	7800Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	TO-1007				S-24A ①	① Drill New Mounting Holes.
T3	7800Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	TO-1007				S-24A ①	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: Madison Fielding PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	4A 125V S/B			313004 (3AG 4A 125V) S/B	342001	MDX 4	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Madison Fielding PART No.	NOTES
M2	Tuning Cap.	CV-1005-1	FM, 3 Gang
M3	Tuning Cap.	CV-1001-1	AM, 3 Gang (Ant. 11—488mmf, RF 11—360mmf, Osc. 15—146mmf)
M4	Switch	SF-1024	Function Selector, Channel 1 (Pushbutton Type)
M5	Switch	SF-1024	Function Selector, Channel 2 (Pushbutton Type)
M6	Switch	SS-1006	Mono-Stereo (DPDT Slide Type)
M7	Switch	SS-1006	Normal-Reverse (DPDT Slide Type)
M8	Switch	SS-1003	Noise (DPDT Slide Type)
M9	Switch	SS-1003	Rumble (DPDT Slide Type)
M10	Switch	SS-1003	Loudness (SPDT Slide Type)
M11	Switch	SS-1003	Monitor (DPDT Slide Type)
M12	Switch	SS-1010	Nulling (4 Pole Spring Loaded)
M13	Switch	SS-1006	Phasing (DPDT, Spring Loaded)
M14	Switch	SS-1009	Speaker Impedance Selection 1 (4 Pole Triple Throw Slide Type)
M15	Switch	SS-1009	Speaker Impedance Selection 2(4 Pole Triple Throw Slide Type)
M16	Switch	SS-1009	Speaker Off-On (SPDT Slide Type)
M17	Switch	ST-1001	Power Off-On (Pushbutton Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

MORROW MODELS CB-1, -2, -3, 5W1-6, -12, -117, 5W3-6, -12, -117

MORROW MODELS CB-1, -2, -3, 5W1-6, -12, -117, 5W3-6, -12, -117

MODEL 5W3-117

MORROW MODELS CB-1, -2, -3, 5W1-6, -12, -117, 5W3-6, -12, -117

TRADE NAME	Morrow Models CB-1, CB-2, CB-3, 5W1-6, 5W1-12, 5W1-117, 5W3-6, 5W3-12, 5W3-117
MANUFACTURER	Morrow Radio Mfg. Co., 2794 Market Street, N. E., Salem, Oregon
TYPE SET	11 Tube Crystal Controlled 3 Channel Citizens Band Transmitter-Receiver (CB Series are Single Channel)
POWER SUPPLY	Models CB-1, 5W1-6, 5W3-6: 6 Volt Storage Battery Models CB-2, 5W1-12, 5W3-12: 12 Volt Storage Battery Models CB-3, 5W1-117, 5W3-117: 110-120 Volts AC, 60 Cycles
RATING	(Model 5W3-117) 68 Watts, .62 Amp. @ 117 Volts AC (Transmit), 61 Watts, .56 Amp. @ 117 Volts AC (Receive) (6 Volt Versions) 8 Amp. @ 6.3 Volts DC (12 Volt Versions) 4 Amp. @ 12.6 Volts DC
TUNING RANGE	Any Citizens Band Channel 1 thru 23

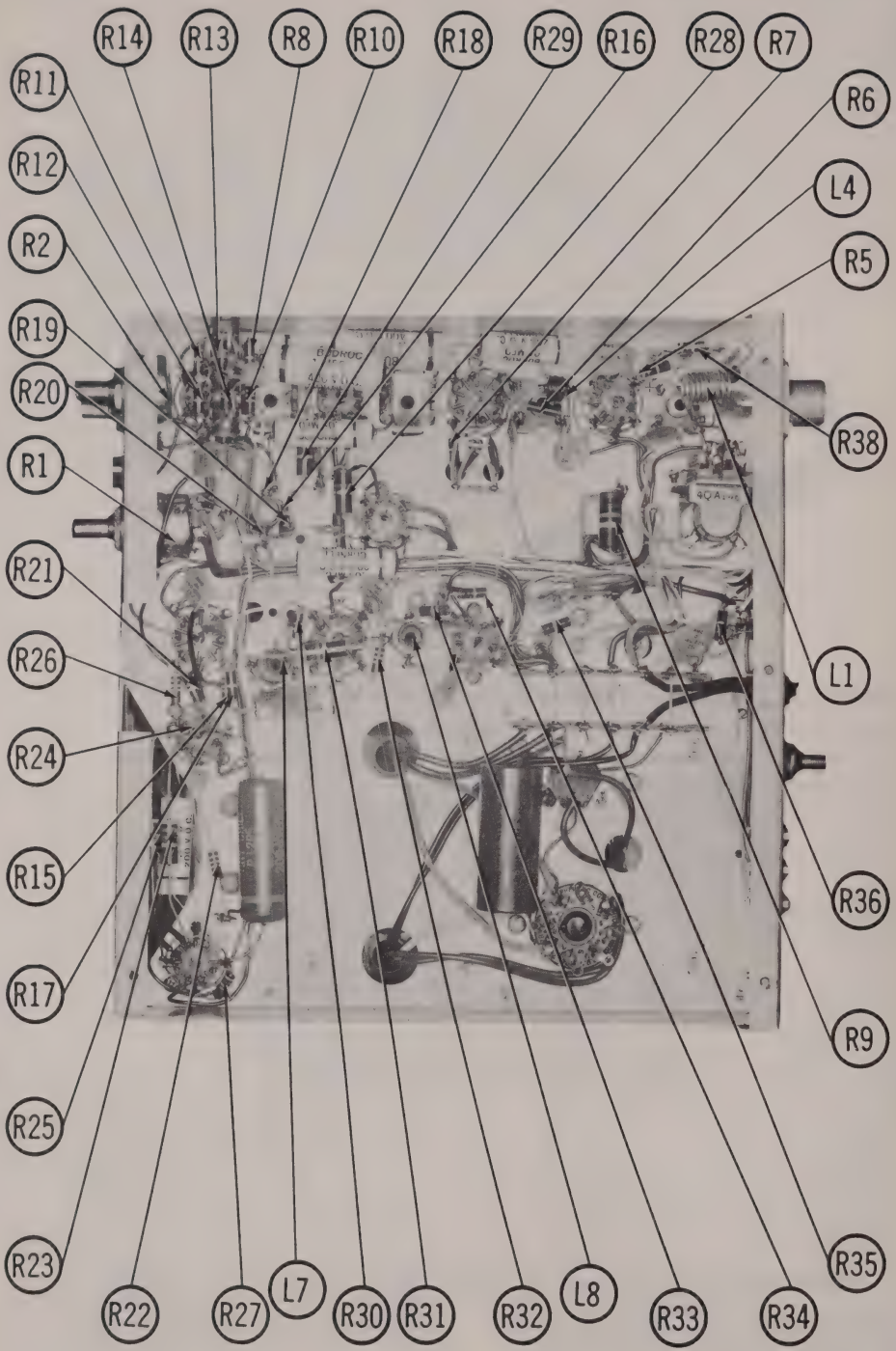
NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO MAKE CRYSTAL SUBSTITUTION OR EFFECT REPAIRS ON THE TRANSMITTER PORTION OF THIS UNIT.

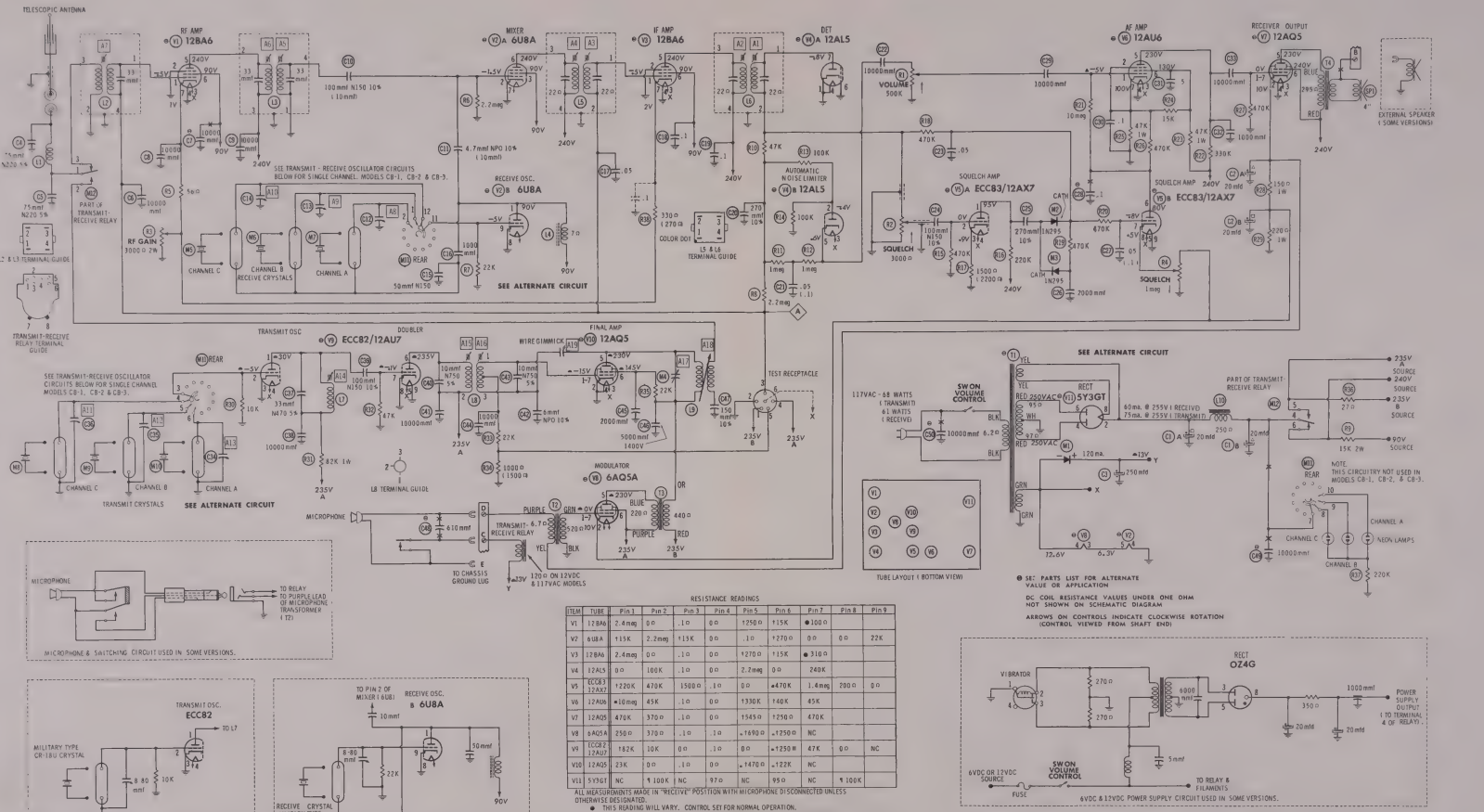
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

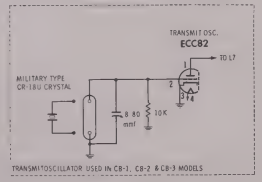
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

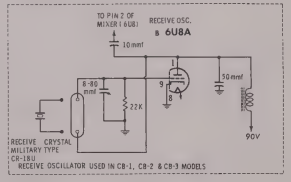
KZ486



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.


TELESCOPIC ANTENNA
RF AMP V1 12BA6
MIXER V2A 6U8A
IF AMP V3 12BA6
DET H4A 12AL5
AF AMP V6 12AU6
RECEIVER OUTPUT V7 12AQ5
RECEIVE OSC. V2B 6U8A
AUTOMATIC NOISE LIMITER H4B 12AL5
SQUELCH AMP V5A ECC83/12AX7
SQUELCH AMP V5B ECC83/12AX7
VOLUME 500K
SQUELCH 3000Ω
SQUELCH 1meg
RF GAIN 3000Ω 2W
CHANNEL C
CHANNEL B RECEIVE CRYSTALS
CHANNEL A
REAR
SEE ALTERNATE CIRCUIT
SEE TRANSMIT - RECEIVE OSCILLATOR CIRCUITS BELOW FOR SINGLE CHANNEL. MODELS CB-1, CB-2 & CB-3.
PART OF TRANSMIT-RECEIVE RELAY
L1 & L3 TERMINAL GUIDE
L5 & L6 TERMINAL GUIDE
TRANSMIT-RECEIVE RELAY TERMINAL GUIDE
COLOR DOT
EXTERNAL SPEAKER (SOME VERSIONS)
TRANSMIT OSC. DOUBLER V5 ECC82/12AU7
FINAL AMP V10 12AQ5
WIRE GIMMICK
MODULATOR V8 6AQ5A
TEST RECEPTACLE
LB TERMINAL GUIDE
TRANSMIT CRYSTALS
MICROPHONE
TRANSMIT-6.7Ω RECEIVE RELAY
TO CHASSIS GROUND LUG
120Ω ON 12VDC & 117VAC MODELS
117VAC - 68 WATTS (TRANSMIT) 61 WATTS (RECEIVE)
SW ON VOLUME CONTROL
RECT 5Y3GT
60 ma. @ 255V RECEIVE
75 ma. @ 255V TRANSMIT
PART OF TRANSMIT-RECEIVE RELAY
NOTE: THIS CIRCUITRY NOT USED IN MODELS CB-1, CB-2, & CB-3.
NEON LAMPS
TUBE LAYOUT (BOTTOM VIEW)
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION




TO PIN 2 OF MIXER (6U8)
RECEIVE OSC. B 6U8A
RECEIVE CRYSTAL (MILITARY TYPE CR-18U)
RECEIVE OSCILLATOR USED IN CB-1, CB-2 & CB-3 MODELS

RECT OZ4G
VIBRATOR
SW ON VOLUME CONTROL
6VDC OR 12VDC SOURCE
FUSE
TO RELAY & FILAMENTS
6VDC & 12VDC POWER SUPPLY CIRCUIT USED IN SOME VERSIONS.
POWER SUPPLY OUTPUT (TO TERMINAL 4 OF RELAY)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	2.4meg	0Ω	.1Ω	0Ω	†250Ω	†15K	●100Ω		
V2	6U8A	†15K	2.2meg	†15K	0Ω	.1Ω	†270Ω	0Ω	0Ω	22K
V3	12BA6	2.4meg	0Ω	.1Ω	0Ω	†270Ω	†15K	●310Ω		
V4	12AL5	0Ω	100K	.1Ω	0Ω	2.7meg	0Ω	240K		
V5	ECC83 12AX7	†220K	470K	1500Ω	.1Ω	0Ω	▲470K	1.4meg	200Ω	0Ω
V6	12AU6	●10meg	45K	.1Ω	0Ω	†330K	†40K	45K		
V7	12AQ5	470K	370Ω	.1Ω	0Ω	†545Ω	†250Ω	470K		
V8	6AQ5A	250Ω	370Ω	.1Ω	.1Ω	▲†690Ω	▲†250Ω	NC		
V9	ECC82 12AU7	†82K	10K	0Ω	.1Ω	0Ω	▲†250Ω	47K	0Ω	NC
V10	12AQ5	23K	0Ω	.1Ω	0Ω	▲†470Ω	▲†22K	NC		
V11	5Y3GT	NC	¶100K	NC	97Ω	NC	95Ω	NC	¶100K	

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION WITH MICROPHONE DISCONNECTED UNLESS OTHERWISE DESIGNATED.

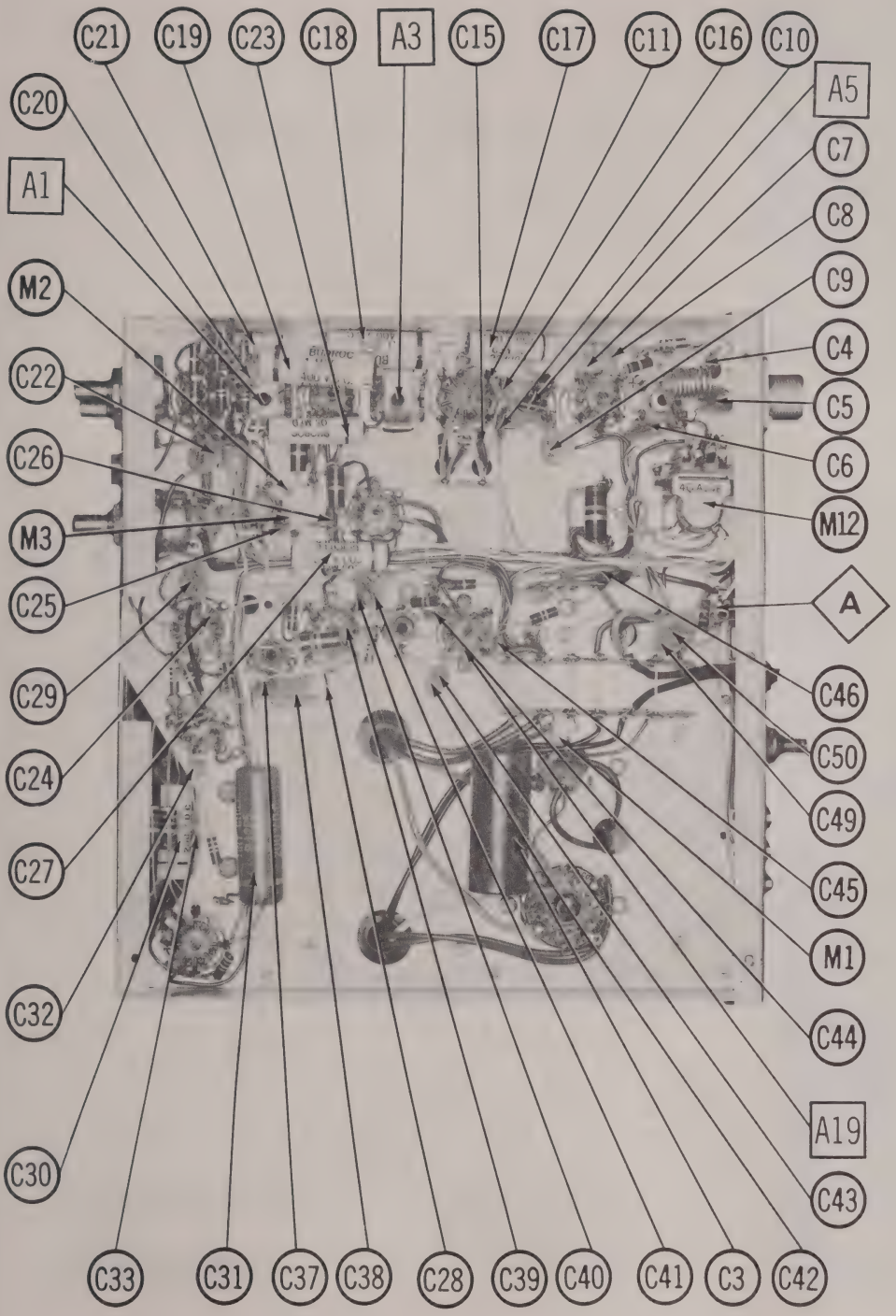
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▲ MEASURED IN "TRANSMIT" POSITION WITH MICROPHONE DISCONNECTED.
■ MEASURED FROM PIN 7 OF V6. ▲ MEASURED FROM CATHODE.
† MEASURED FROM PIN 2 OF V11. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

MORROW MODELS CB-1, -2, -3, SW1-6, -12, -117, SW3-6, -12, -117

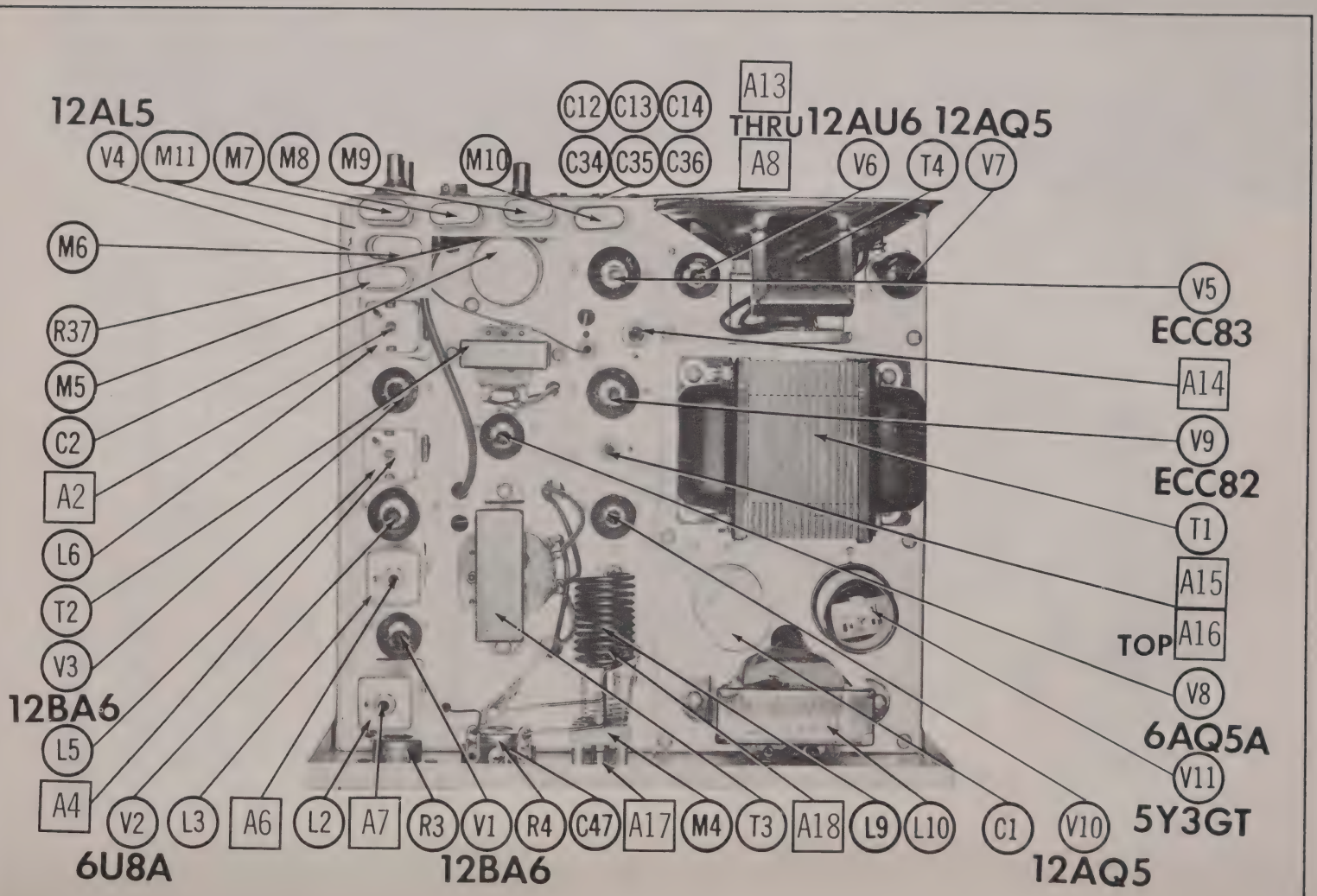
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1961



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

MORROW MODELS CB-1, -2, -3, 5W1-6, -12, -117, 5W3-6, -12, -117

FOLDER 7



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆							
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V1	RF Amplifier	12BA6	Note 1	V6	AF Amplifier	12AU6	Note 1
V2	Mixer-Osc.	6U8A		V7	Receiver Output	12AQ5	Note 1
V3	IF Amplifier	12BA6	Note 1	V8	Modulator	6AQ5A	
V4	Det. -ANL	12AL5	Note 1	V9	Trans. Osc. -Doubler	ECC82/12AU7	Note 1
V5	Squelch Amplifier	ECC83/12AX7	Note 1	V10	Final Amplifier	12AQ5	Note 1
				V11	Rectifier	5Y3GT	Note 2

Note 1. 6 Volt Models use 6V Equivalent.
Note 2. 6-12 Volt Models use OZ4 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT.	MORROW PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350		AFH2-37	B0300	FP227	TMD-2375	TVL-2755	
B	▲20	350							
C2A	▲20	25		AFH2-03	B0050	FP208	TMD-2075	TVL-2415	
B	■20	25							
C3	250	15		PRS1210	BR2501	TC50025	TD-250-15	TVA-1161	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	75 N220 5%					*		
C5	75 N220 5%					*		
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	100 N150 10%	(10) †				*		10TCP-T10
C11	4.7 NPO 10%	(10) †	NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C12								
C13								
C14								
C15	50 N150					*		10TCP-Q50
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-415	GEM-415	2TM-S50
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C19	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C20	270 10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C21	.05 200V	(.1) †	P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-215	2TM-S50
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C24	100 N150 10%					*		10TCP-T10
C25	270 10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C26	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C27	.05 200V	(.1) †	P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C28	.1 200V	Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C31	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C32	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34								
C35								
C36								
C37	33 N470 5%					*		
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	100 N150 10%					*		10TCP-T10
C40	10 N750 5%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C41	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	6 NPO 10%		NPO-DI 6.8	DTZ-6R8	C10V6C	CCTO-6R8	CNO-568	10TCC-V68

ALIGNMENT INSTRUCTIONS

RECEIVER

1. Connect DC probe of VTVM to point (A), Common to chassis. Turn squelch controls, R2 and R4 on front and rear panels, to maximum clockwise position.

   Connect a 470K resistor across the secondary of L5 (1st IF Trans).

   Connect high side of Signal Generator (455KC, 400~ Mod.) thru .05mfd to pin 2 of V2A, low side to chassis. Adjust A1, A2, A3 and A4 for maximum deflection.

2. Connect high side of Signal Generator tuned to the proper channel frequency, (400~ Mod.) to the antenna socket. Adjust A5, A6 and A7 for maximum deflection. Retouch A1, A2, A3, and A4. Remove 470K resistor.

3. Using a Frequency Meter, Adjust A8, A9 and A10 to exact frequency marked on oscillator crystals (within 100 cps).

TRANSMITTER

1. Connect a 50 ohm dummy load to antenna. Using a Frequency Meter, Adjust A11, A12 and A13 to the exact frequency marked on oscillator crystals, (within 100 cps).

2. Connect a 0-50 ma. meter to pins 1 and 4 and a 0-2 ma. meter to pins 2 and 5 of test jack on rear panel. Adjust A14 for maximum grid current and then back off 10% on the long slope.

   Adjust A15 and A16 for maximum grid current.

   Adjust A17 for minimum plate current, then Adjust A18 for 20 ma. at a plate voltage of 250 Volts. Do not exceed 23 ma. of plate current.

3. The power amplifier requires neutralization. Grid current will be maximum when the plate current is minimum as A17 is tuned through resonance. Slight adjustment of A19 may be necessary in the field.

4. Remove the 50 ohm dummy load and connect transmitter to the antenna.

   Adjust A17 for minimum plate current then adjust A18 for 20 ma. plate current.

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	10 N750 5%		N750-DI 10	DTN-10	C10Q1U	CCTN-10	CN7-410	10TCU-Q10
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C46	5000 1400V		DAC-9	DD16-502	HVE16D5	8CCD-502	UAC-250	BL-050
C47	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C48	610	Note 1			L10T62	CM-19B-621M	GP360	10TS-T60
C49	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

Note 1. Not used in some versions.
† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MORROW PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	311-001	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
C2A	3000Ω	½	311-021	B-8	A47-3000-S	Q11-112	U-8	Squelch
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3	3000Ω	2(WW)	311-010	WN-302	39-3000	112-3000	FL-3K	RF Gain
R4A	1meg	½	311-022	B-69	A47-1meg-S	Q11-137	U54	Squelch
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

MORROW MODELS CB-1, -2, -3, SW1-6, -12, -117, SW3-6, -12, -117

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No	WORKMAN TV PART No.	REMARKS
R5	56Ω			
R6	2.2meg			
R7	22K			
R8	2.2meg			
R9	15K 2W			
R10	47K			
R11	1meg			
R12	1meg			
R13	100K			
R14	100K			
R15	470K			
R16	220K			
R17	1500Ω			(2200Ω) *
R18	470K			
R19	470K			
R20	470K			
R21	10meg			
R22	330K			
R23	47K 1W			
R24	15K			
R25	47K 1W			
R26	470K			
R27	470K			
R28	150Ω 1W			
R29	220Ω 1W			
R30	10K			
R31	82K 1W			
R32	47K			
R33	22K			
R34	1000Ω			(1500Ω) *
R35	22K			
R36	27Ω			
R37	220K			
R38	330Ω			(270Ω) *

* Used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	RF Choke (.3uh)						
L2	Ant.	108-126		6252	RTC-8570	T234	
L3	RF	108-127					
L4	RF Choke (500uh)		TV-203	6174	RTC-8592	T324	
L5	Input IF	108-506	BC-352	12-C1	RTC-8632	T607	
L6	Output IF	108-506	BC-353	12-C2	RTC-8633	T608	
L7	Osc. Plate	108-128	TV-118	6171-A	RTC-8609	T216	
L8	Driver	108-129					
L9	Final Plate						

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L10	.075A	250Ω	11 HY	120-055			26C84	C-8X	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V Ⓐ .62A	500VCT Ⓐ .075A	5V Ⓐ 2A	120-137 ①					① Part #120-135 used in 6V Operation. Part #120-136 used in 12V Operation.
	SEC. 3	SEC. 4	SEC. 5						
	12.6V Ⓐ 1.8A								

TRANSFORMER (MIC)

ITEM No.	TURNS RATIO: PRI.	SEC.	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	1	11	120-133				A-3X	

TRANSFORMER (MOD)

ITEM No.	TURNS RATIO: PRI.	SEC.	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	1	1	120-134					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MORROW PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	4800Ω	3-4Ω	439-520 ①	A-3026		24S48	S-6X	① Includes Speaker

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MORROW PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	439-520 *	4A1	* Includes T4

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: MORROW PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.120A		1N1763 *	2F4 *	SR200 *	* Silicon Type

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MORROW PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295			1N295	1N295	Squelch
M3	1N295			1N295	1N295	Squelch

MISCELLANEOUS

ITEM No.	PART NAME	MORROW PART No.	NOTES
M4	Variable Cap.		
M5	Crystal		Receive (Order by Freq. - Desired) Note 1
M6	Crystal		Receive (Order by Freq. -Desired) Note 1
M7	Crystal		Receive (Order by Freq. -Desired) Note 1
M8	Crystal		Transmit (Order by Freq. -Desired) Note 2
M9	Crystal		Transmit (Order by Freq. -Desired) Note 2
M10	Crystal		Transmit (Order by Freq. -Desired) Note 2
M11	Switch		Channel Selector
M12	Realy	148-014	12V (For 12VDC and 117VAC Versions)
	Relay	148-015	6V (For 6VDC Versions)

Manufacturer recommends military type crystal CR-18U

Note 1. M6 and M7 not used in CB series. To compute crystal frequency, subtract .455 from channel frequency in megacycles and divide by 3.

Note 2. M9 and M10 not used in CB series. To compute crystal frequency divide channel frequency in megacycles by 2.

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

NORDMENDE MODEL
Transita

NORDMENDE MODEL
Transita

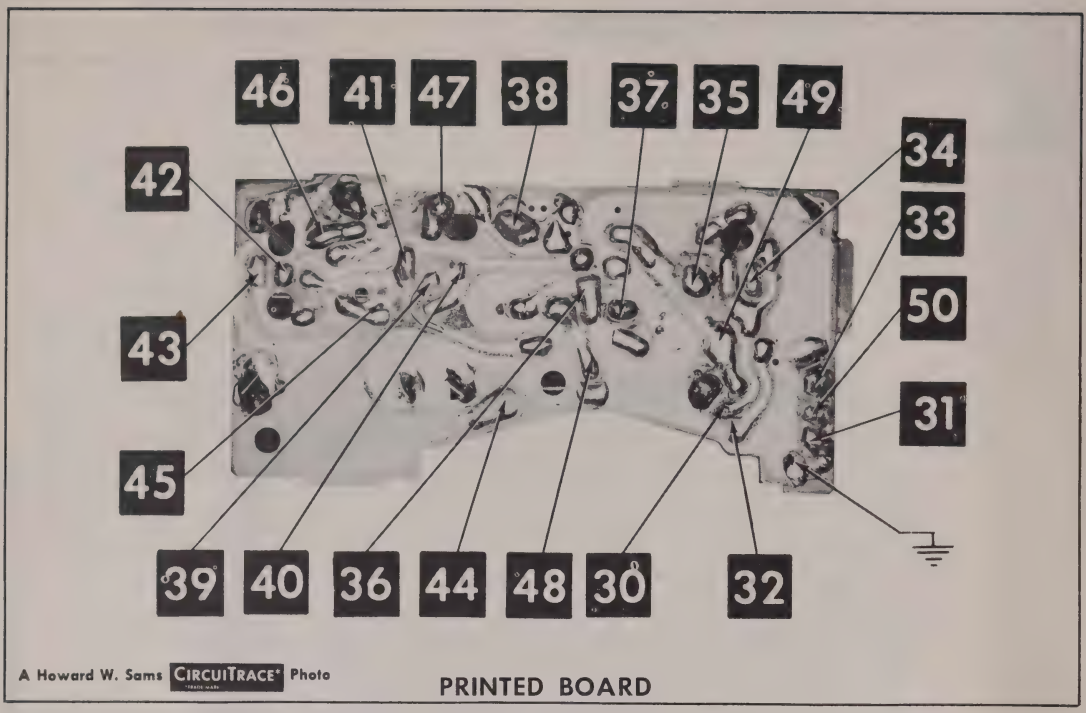
NORDMENDE MODEL
Transita

TRADE NAME	Nordmende Model Transita	
IMPORTER	Sterling Hi-Fidelity, Inc., 22-14 40th Ave., Long Island City 1, N. Y.	
TYPE SET	Battery operated Transistorized Portable FM-BC-SW Receiver	
POWER SUPPLY	9 Volts DC	RATING 13MA @ 9 Volts DC (No signal, Min. Volume) BC 17MA @ 9 Volts DC (No signal, Min. Volume) FM 20MA @ 9 Volts DC (Signal, Normal Volume) BC-FM
TUNING RANGES	BROADCAST 540-1600KC FREQ. MOD. 88-108MC SHORT WAVE 5.9-9.8MC	

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

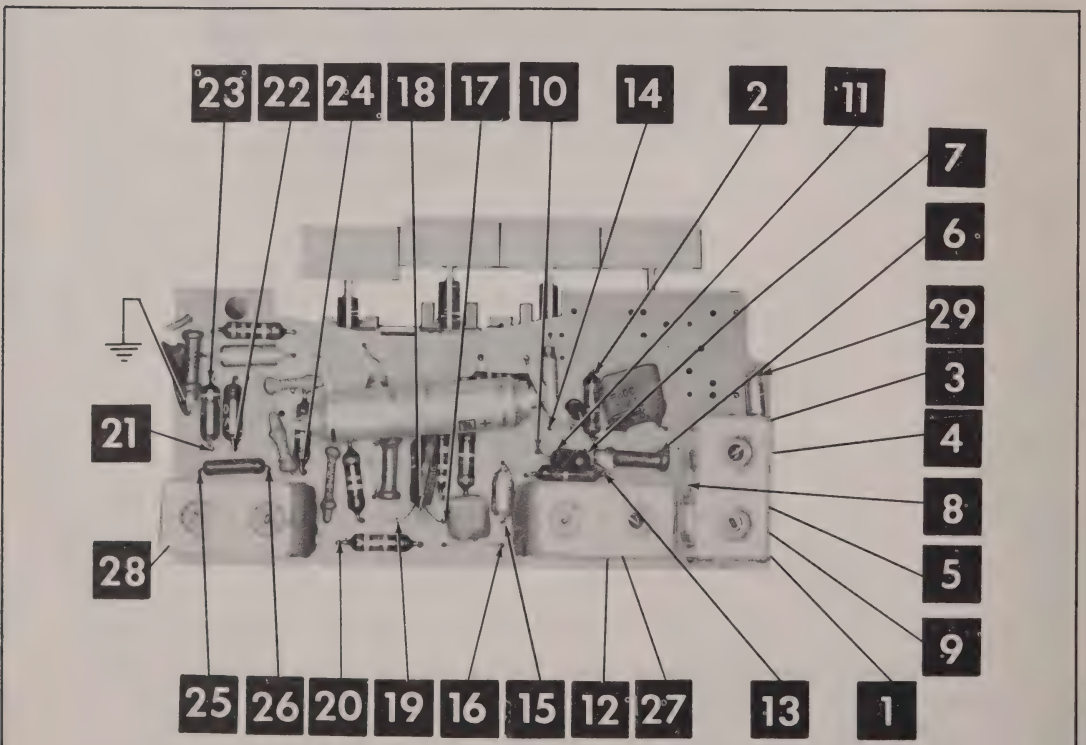
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF465



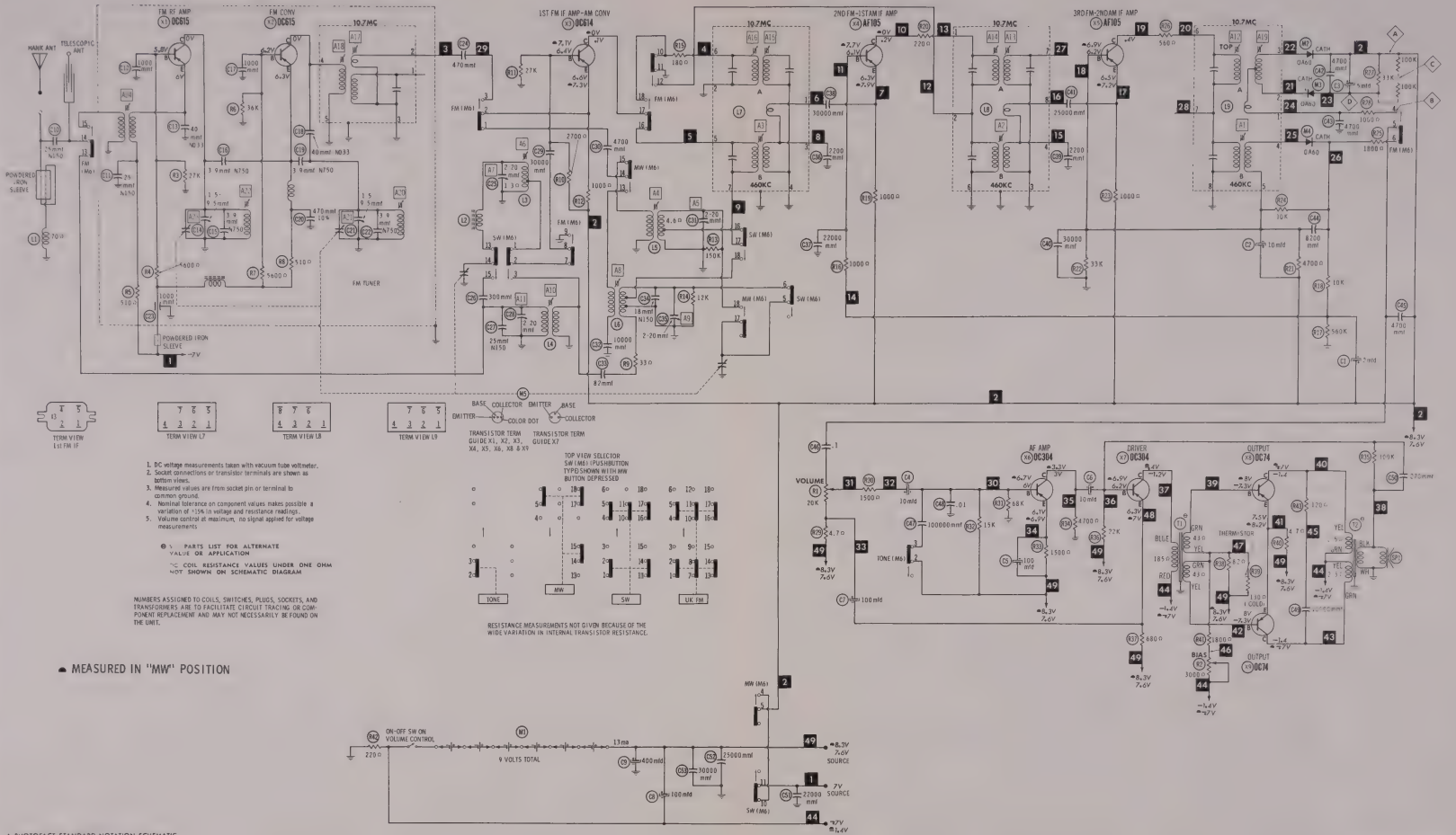
A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD



A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements

⊛ PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

⌒ COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

● MEASURED IN "MW" POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
©Howard W. Sams & Co., Inc. 1961

NORDMENDE MODEL
Transita

AM ALIGNMENT INSTRUCTIONS

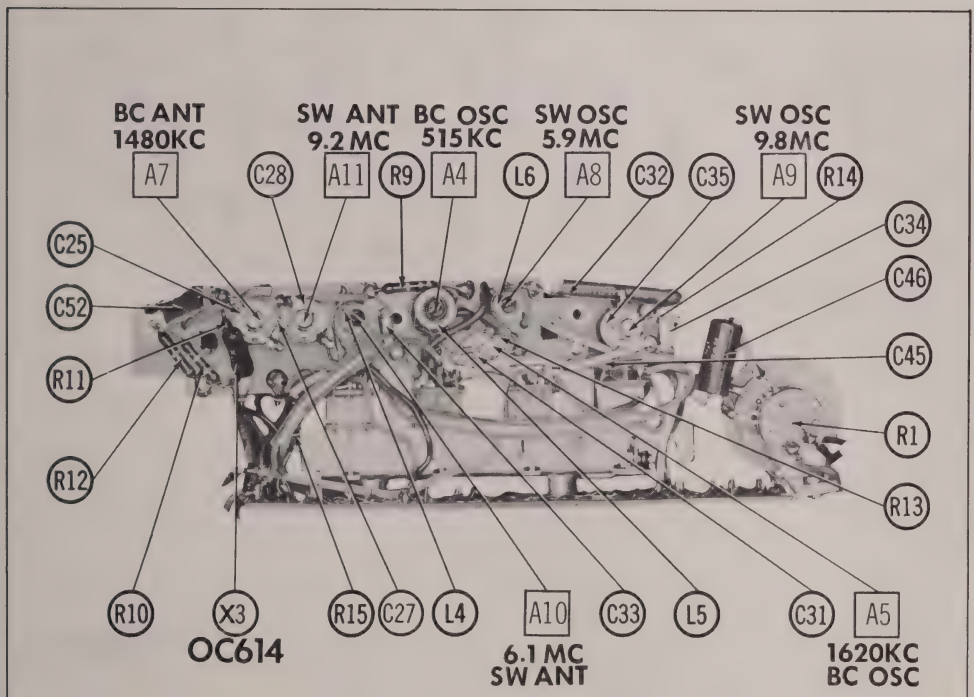
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4, A8, A10, A12 thru A20, A22, A24. . .GENERAL CEMENT #9440
A5, A7, A9, A11, A21, A23. . . . . .GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .005mfd to Base of AM converter. Low side to chassis.	460KC (400∿ AM)	(MW) Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	515KC	Tuning gang fully closed.	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1620KC	Tuning gang fully open.	"	A5	"
4.	"	550KC	550KC	"	A6	"
5.	"	1480KC	1480KC	"	A7	Adjust for maximum output. Repeat Steps 2 thru 5.
6.	High side thru 10meg to telescoping antenna. Low side to chassis.	5.9MC	(SW) Tuning gang fully closed.	"	A8	Adjust for maximum output.
7.	"	9.8MC	Tuning gang fully open.	"	A9	"
8.	"	6.1MC	6.1MC	"	A10	"
9.	"	9.2MC	9.2MC	"	A11	Adjust for maximum output. Repeat Steps 6 thru 9.



CHASSIS BOTTOM VIEW

FM ALIGNMENT INSTRUCTIONS

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

Connect two matched 100K (± 1%) resistors in series from point Ⓐ to point Ⓓ. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	High side to antenna connection. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A12, A13, A14, A15, A16, A17, A18	Adjust for maximum deflection.
11.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
10.	High side to antenna connection. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A12, A13, A14, A15, A16, A17, A18	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
11.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A19	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	High side to antenna connection. Low side to chassis.	88MC (Unmod.)	(FM) 88MC	DC probe to point Ⓐ. Common to chassis.	A20	Adjust for maximum deflection.
13.	"	108MC	108MC	"	A21	
14.	"	90MC	90MC	"	A22	"
15.	"	106MC	106MC	"	A23	"
16.	"	98MC	98MC	"	A24	"

FIG. 1

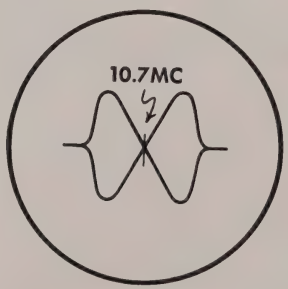
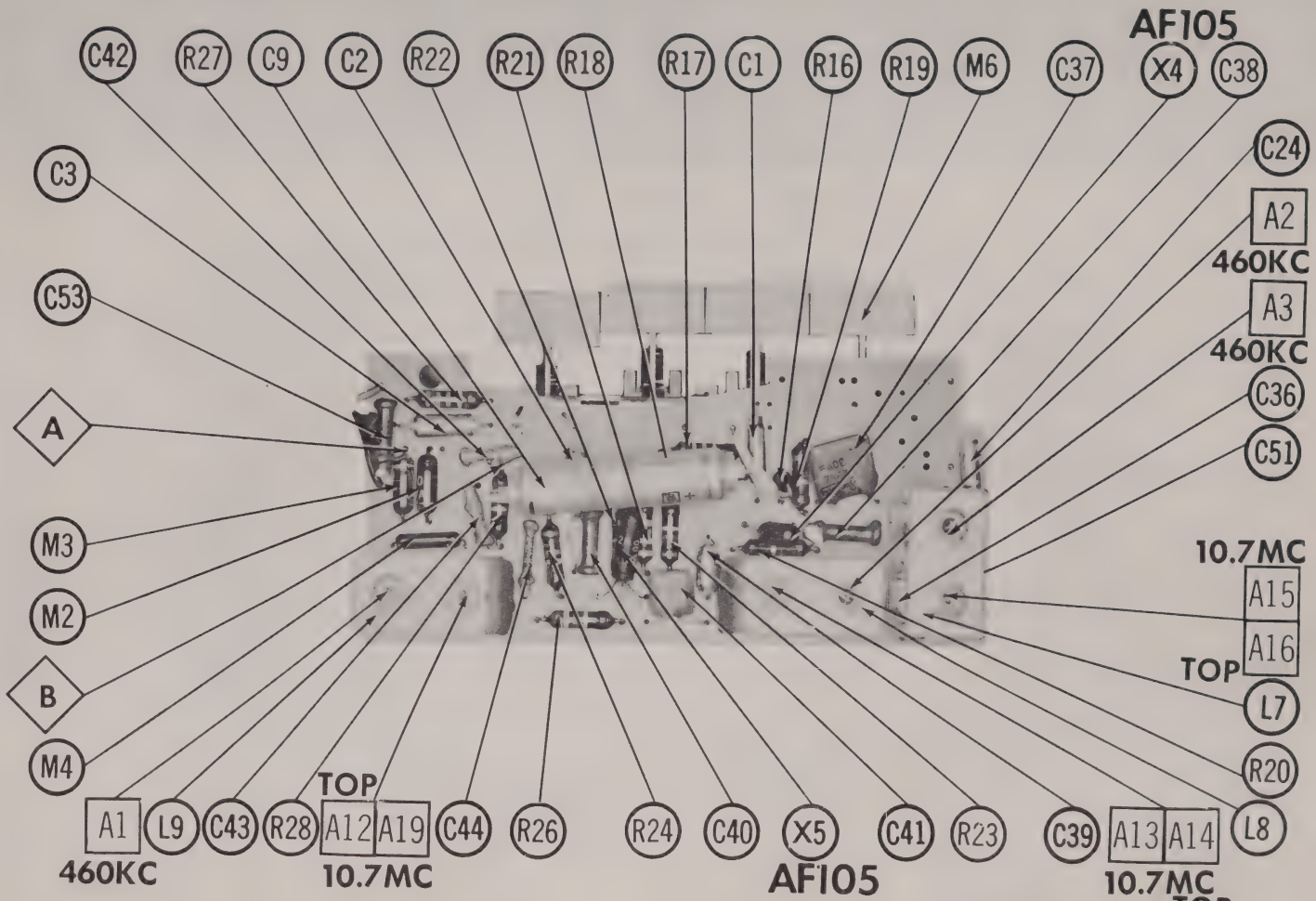


FIG. 2



IF CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC615	FM RF Amplifier	2N1179			PNP
X2	OC615	FM Converter	2N1178			PNP
X3	OC614	1st FM IF Amp. -AM Conv.	2N1180			PNP
X4	AF105	2nd FM-1st AM IF Amp.	2N1180			PNP
X5	AF105	3rd FM-2nd AM IF Amp.	2N1180			PNP
X6	OC304	AF Amplifier	2N406			PNP
X7	OC304	Driver	2N406			PNP
X8	OC74	Output	2N408			PNP
X9	OC74	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	NORDMENDE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	2	6	443.041.19	PTT-6002	NLW2-50	TT6X2	MLV2-6	TE-1051	
C2	10	6	443.042.19	PTT-6010	NLW10-6	TT6X10	MLV10-6	TE-1087	
C3	5	15	443.047.15	PTT-15005	NLW5-15	TT25X5	MLV5-15	TE-1152	
C4	10	6	443.042.19	PTT-6010	NLW10-6	TT6X10	MLV10-6	TE-1087	
C5	100	3	443.040.15	PTT-3100	NLW100-3	TT6X100	MLV100-3	TE-1059.5	
C6	10	6	443.042.19	PTT-6010	NLW10-6	TT6X10	MLV10-6	TE-1087	
C7	100	3	443.040.15	PTT-3100	NLW100-3	TT6X100	MLV100-3	TE-1059.5	
C8	100	15	443.044.15	PTT-15100	NLW100-15	TT15X100	MLV100-15	TE-1162	
C9	400	12	443.048.15				MLV200-12 MLV200-12	TVAS-1161.5*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	25 N150					*		
C11	25 N150					*		
C12	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	40 N033					*		
C14	1.5-9.5	#447.036.15				*		
C15	3.9 N750							
C16	3.9 N750							
C17	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C18	40 N033					*		
C19	3.9 N750							
C20	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C21	1.5-9.5	#447.036.15						
C22	3.9 N750							
C23	1000		EF-001	MFT-1000		CCF-102	CT280A	
C24	470		SI 470	D6-471	BYA10T47	CCD-471	B-347	10TS-T47
C25	2-20	#447.037.15						
C26	300		SI 300	D6-301	L10T3	CCD-301	GP330	10TS-T30
C27	25 N150					*		10TCP-Q27
C28	2-20	#447.037.15						
C29	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C30	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C31	2-20	#447.037.15						
C32	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	82		SI 82	D6-820	L10Q82	CCD-820	GP482	10TS-Q82
C34	18 N150					*		10TCP-Q18
C35	2-20	#447.037.15						
C36	2200		SI 2200	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C37	22000		SI 20000	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C38	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C39	2200		SI 2200	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C40	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C41	25000					H-05S25	IDP-1-253	TA-125	5HK-S25
C42	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C43	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C44	8200		SI 8200	D6-822		CCD-822	B-282	
C45	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C46	.1 150V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C47	100000		C80V104AM	DF-104	H-05P1	IDP-2-104	TA-010	TG-P10
C48	.01 150V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-201	2TM-P10
C49	10000		BPD-01	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	270		SI 270	D6-271	L10T27	CCD-271	B-327	10TS-T27
C51	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C52	25000				H-05S25	IDP-1-253	TA-125	5HK-S25
C53	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Nordmende Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NORDMENDE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	20K	1/4	402.212.14					Volume
B	Switch							Power Off-On
R2	3000Ω	1/4	402.087.15					Bias

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	27K				R23	1000Ω			
R4	5600Ω				R24	10K			
R5	510Ω				R25	1800Ω			
R6	36K				R26	500Ω			
R7	5600Ω				R27	33K			
R8	510Ω				R28	1000Ω			
R9	33Ω				R29	4.7Ω			
R10	2700Ω				R30	1500Ω			
R11	27K				R31	68K			
R12	1000Ω				R32	15K			
R13	150K				R33	1500Ω			
R14	12K				R34	4700Ω			
R15	180Ω				R35	100K			
R16	1000Ω				R36	22K			
R17	560K				R37	680Ω			
R18	10K				R38	82Ω			
R19	1000Ω				R39	130Ω Cold			#404.001.15
R20	220Ω				R40	4.7Ω			
R21	4700Ω				R41	1800Ω			
R22	33K				R42	220Ω			
					R43	120Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		NORDMENDE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke						
L2	RF Choke						
L3	Loopstick	466.051.15					
L4	SW Ant.						
L5	BC Osc.						
L6	SW Osc.						
L7A	2nd FM IF	520.172.24					
B	1st AM IF						
L8A	3rd FM IF	520.173.24					
B	2nd AM IF						
L9A	Ratio Detector	520.174.24					
B	3rd AM IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	NORDMENDE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3	1	522.029.14①					① Alternate Part #522.026.13

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	NORDMENDE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	3-4Ω	522.030.23①					① Alternate Part #522.027.13

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	NORDMENDE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	470.063.14	4A1RZ4	

BATTERIES

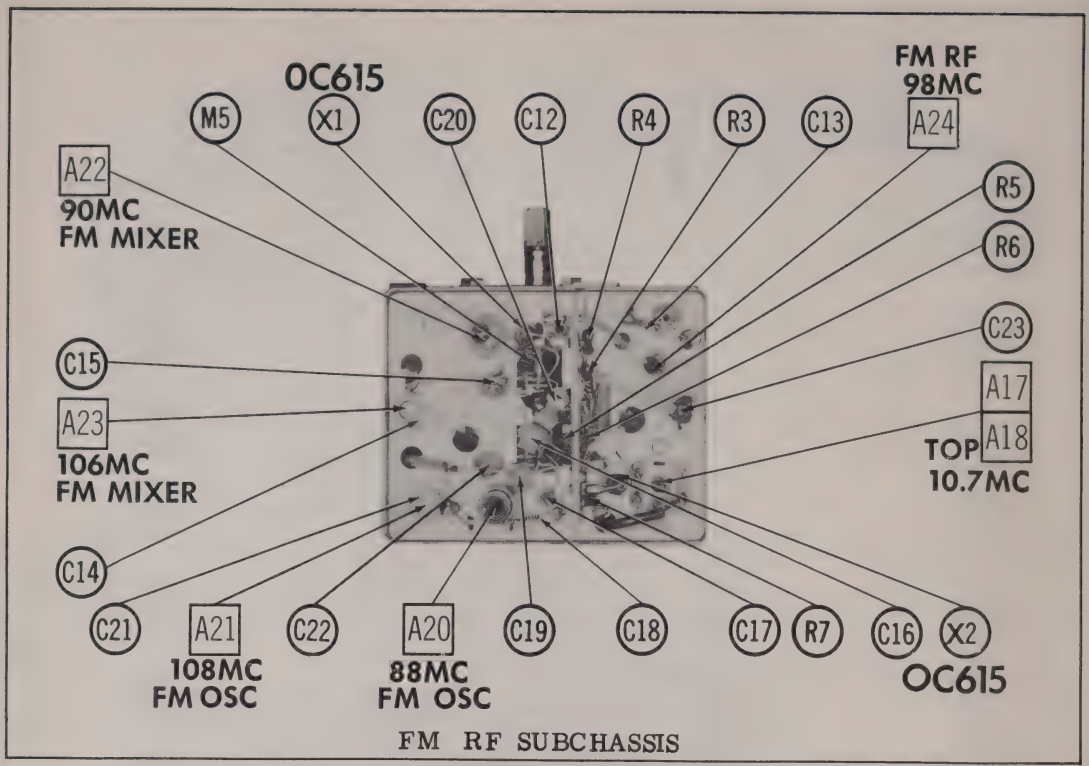
ITEM No.	VOLTAGE	NORDMENDE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			130		635		M-14R	6 Required

SIGNAL DIODES

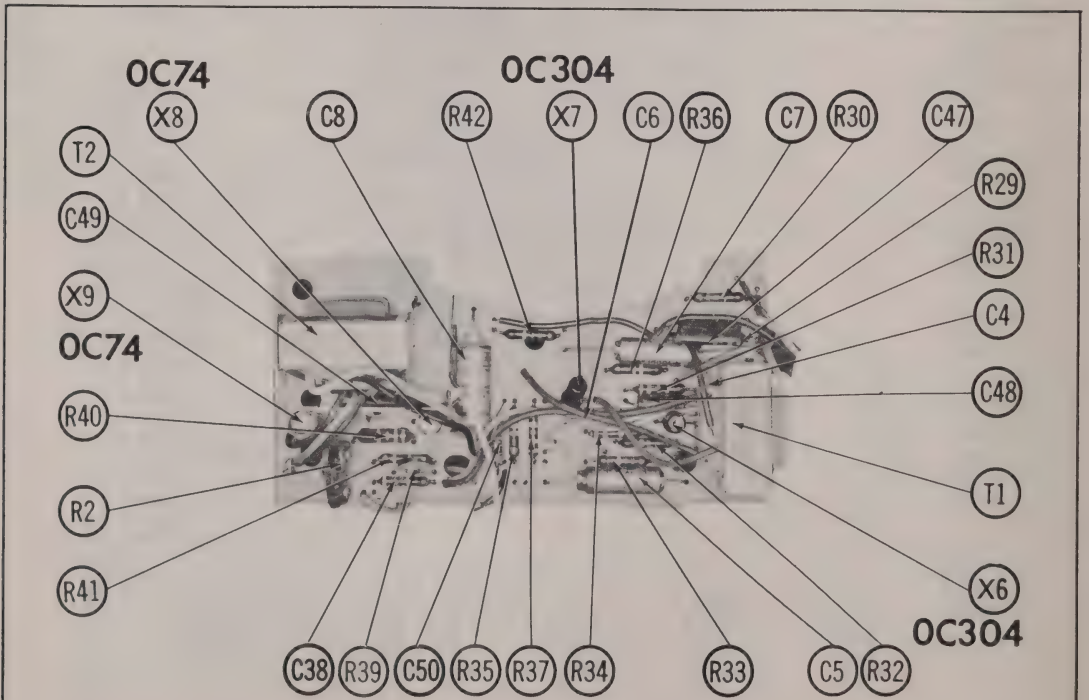
ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		NORDMENDE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	OA60	464.022.15		1N295	1N295	Discriminator
M3	OA60	464.022.15		1N295	1N295	AM Detector
M4	OA60	464.021.15		1N60	1N60	

MISCELLANEOUS

ITEM No.	PART NAME	NORDMENDE PART No.	NOTES
M5	Tuning Cap.	446.001.14	4 Gang, FM-AM
M6	Switch	472.047.13	Function Selector (Pushbutton)



FM RF SUBCHASSIS



OUTPUT CHASSIS

PHOTOFACT® Folder

OLSON MODEL RA-350

OLSON MODEL RA-350

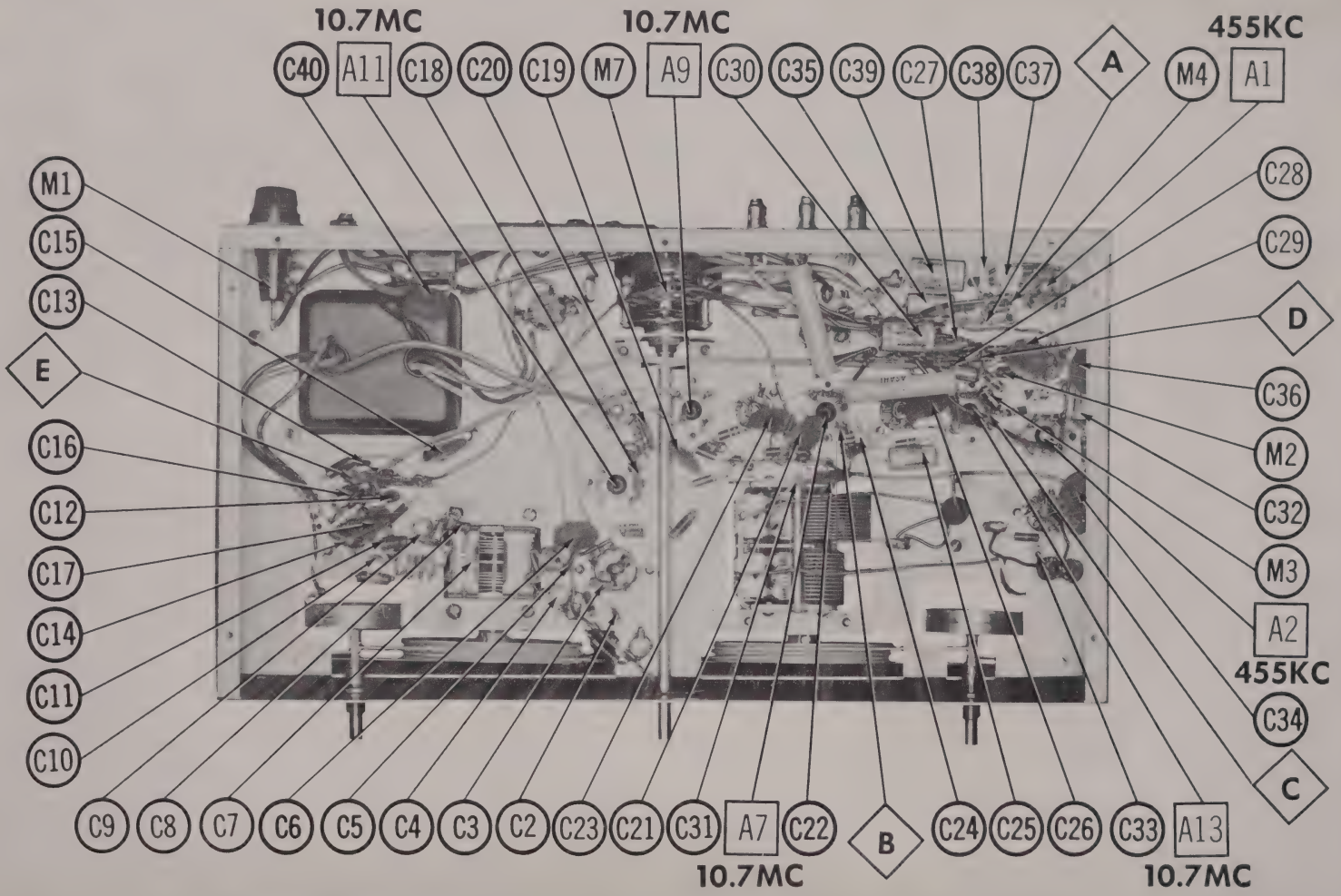
OLSON MODEL RA-350

TRADE NAME	Olson Model RA-350		
SUPPLIER	Olson Radio Corp., 260 S. Forge Street, Akron 8, Ohio		
TYPE SET	AC Operated 8 Tube FM-AM Tuner		
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles	RATING	35 Watts, .4 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 — 1605KC	FREQ. MOD.	88 — 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KL491

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools:
A1, A2, A3, A5, A15, A16.... GENERAL CEMENT #8721, 8722
WALSCO #2519
A4, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A7 thru A14..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400% Mod.)	(AM) Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	1600KC	1600KC	"	A4	"
3.	High side thru .01mfd to AM antenna terminal. Low side to chassis.	600KC	600KC	"	A5	Adjust for maximum output.
4.	"	1400KC	1400KC	"	A6	Adjust for maximum deflection. Repeat Steps 2, 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .001mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (B). Common to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum deflection.
6.	"	"	"	DC probe thru 1meg to point (C). Common to chassis.	A13	"
7.	"	"	"	DC probe to point (D). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .001mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. thru 47K to point (C). Low side to chassis.	A13	"
7.	"	"	"	Vert. amp. to point (D). Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

Short point (E) to chassis.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru 300Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	(FM) 108MC	DC probe to point (B). Common to chassis.	A15	Adjust for maximum deflection.
9.	"	100MC	100MC	"	A16	"

FIG. 1

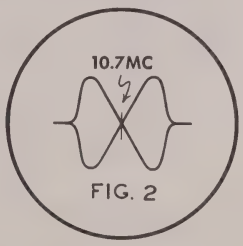
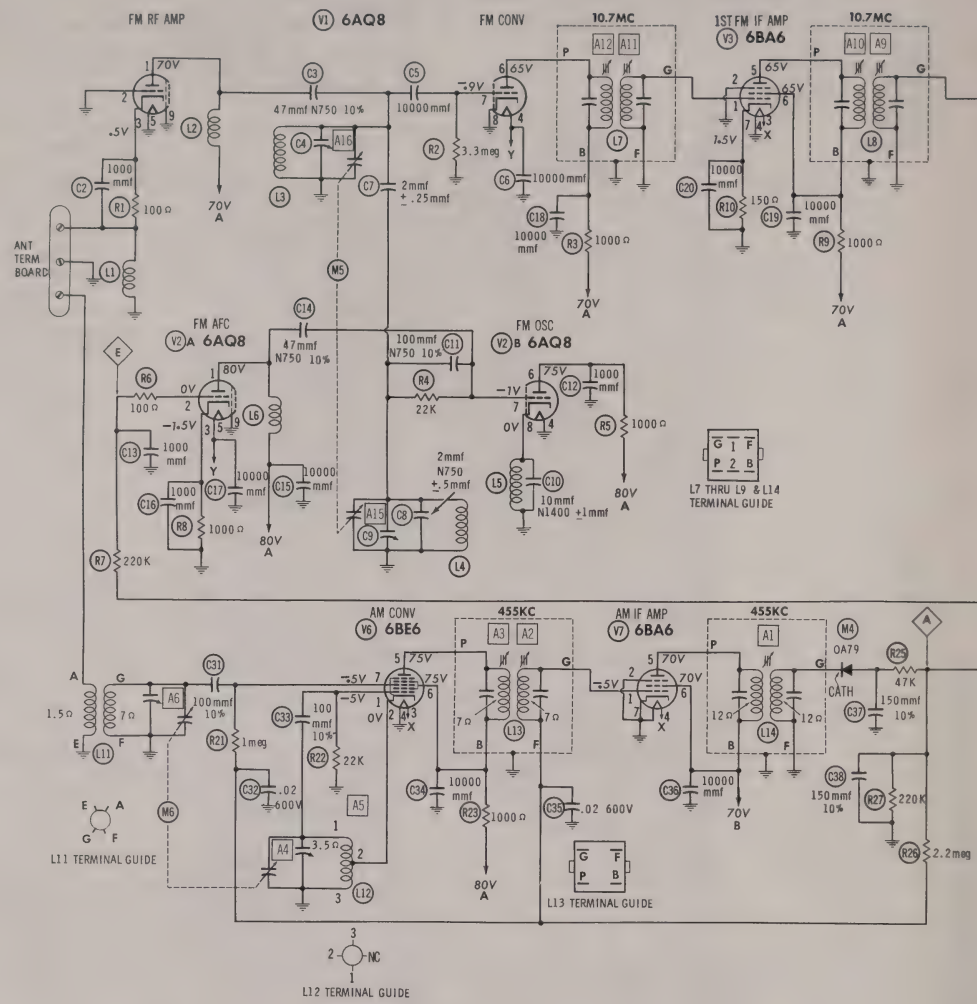


FIG. 2



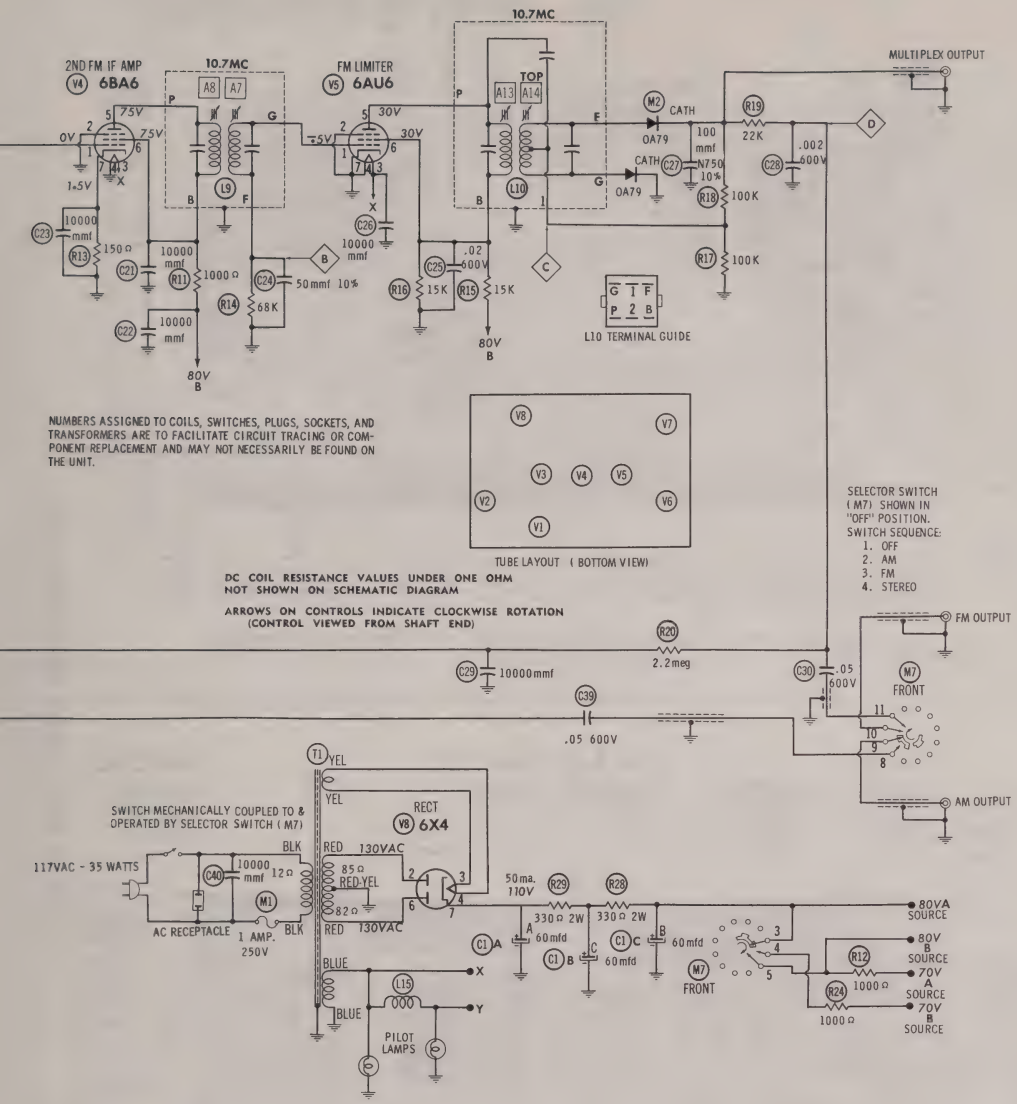
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8	†1600Ω	0Ω	100Ω	0Ω	.1Ω	†2600Ω	3.3meg	0Ω	0Ω
V2	6AQ8	†660Ω	2.6meg	1000Ω	.1Ω	0Ω	†1600Ω	22K	0Ω	0Ω
V3	6BA6	.1Ω	0Ω	.1Ω	0Ω	†2600Ω	†2600Ω	150Ω		
V4	6BA6	.1Ω	0Ω	.1Ω	0Ω	†1600Ω	†1600Ω	150Ω		
V5	6AU6	68K	0Ω	.1Ω	0Ω	†15K	†15K	0Ω		
V6	6BE6	22K	.6Ω	0Ω	.1Ω	†1600Ω	†1600Ω	3.4meg		
V7	6BA6	2.4meg	0Ω	.1Ω	0Ω	†1600Ω	†1600Ω	0Ω		
V8	6X4	NC	85Ω	INF	INF	NC	82Ω	¶ INF		

ALL MEASUREMENTS MADE IN "STEREO" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V8. NC NO CONNECTION

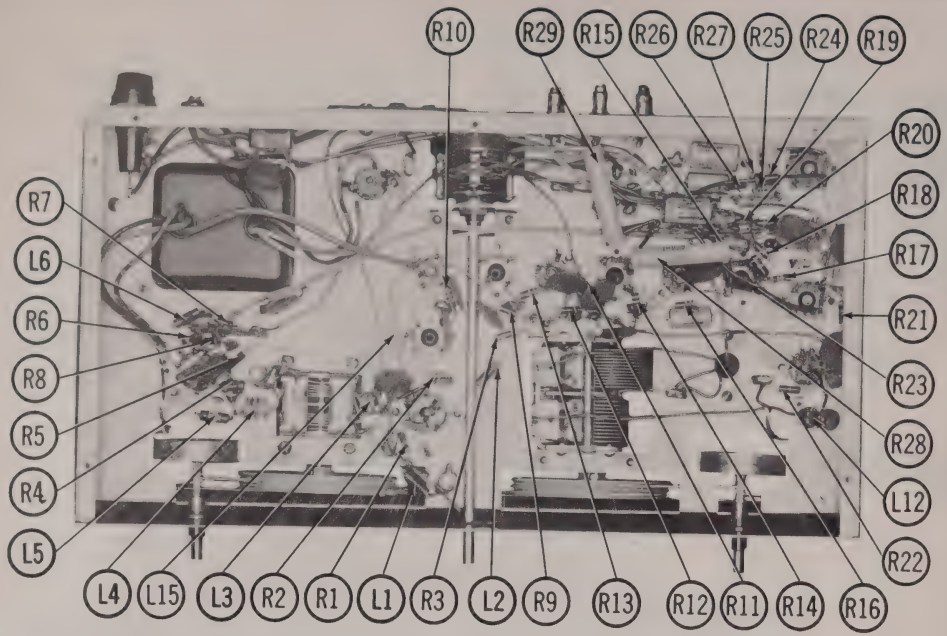
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1961

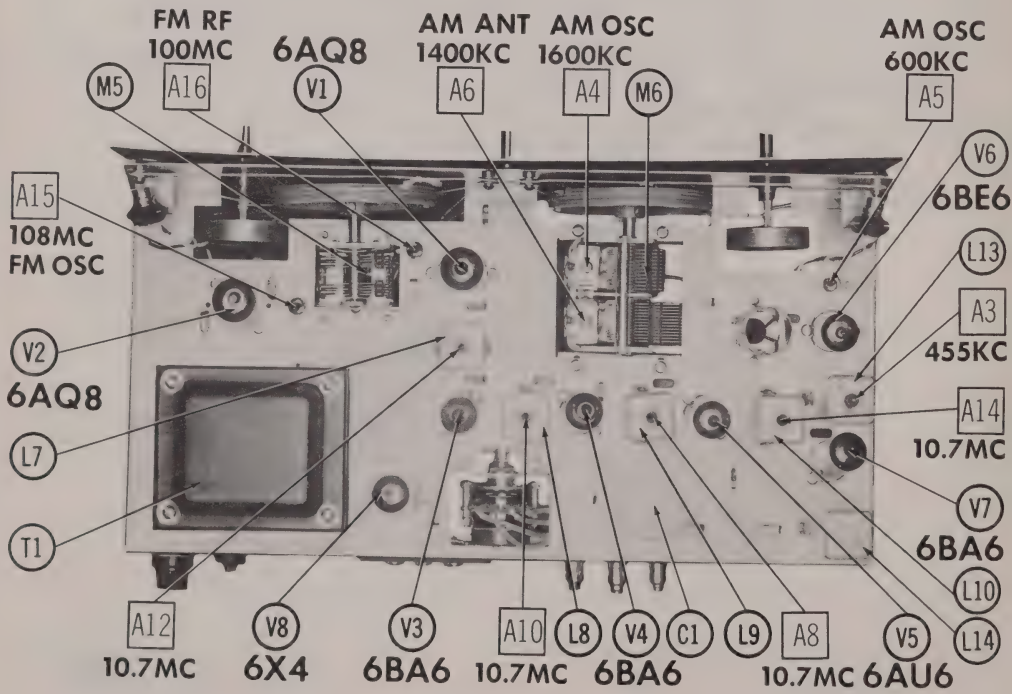


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.

OLSON MODEL RA-350



CHASSIS BOTTOM VIEW-RESISTOR INDUCTOR IDENT.



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	6AQ8
V2	FM Osc. -AFC	6AQ8
V3	1st FM IF Amplifier	6BA6
V4	2nd FM IF Amplifier	6BA6
V5	FM Limiter	6AU6
V6	AM Converter	6BE6
V7	AM IF Amplifier	6BA6
V8	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	Ⓐ60	150		AFH3-11-50	XC0105	FP311.65	TMT-3133	TVL-3442	
B	Ⓑ60	150							
C	Ⓒ60	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C3	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C4								
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	2 ± .25mmf		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C8	2 N750 ± .5mmf						CN7-522	10TCU-V22
C9								
C10	10 N1400 ± 1mmf					*		
C11	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	1000		BPD-001	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	50 10%		NPO-SI 50	D6-500	L10Q5	CCD-500	GP450	10TS-Q50
C25	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C28	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C31	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C32	.02 600V		P688N-02	DD-203	CUB6S2	6DP-1-203	GEM-612	6TM-S20
C33	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.02 600V		P688N-02	DD-203	CUB6S2	6DP-1-203	GEM-612	6TM-S20
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15
C38	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15
C39	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	100Ω			
R2	3.3meg			
R3	1000Ω			
R4	22K			
R5	1000Ω			
R6	100Ω			
R7	220K			
R8	1000Ω			
R9	1000Ω			
R10	150Ω			
R11	1000Ω			
R12	1000Ω			
R13	150Ω			
R14	68K			
R15	15K			
R16	15K			
R17	100K			
R18	100K			
R19	22K			
R20	2.2meg			
R21	1meg			
R22	22K			
R23	1000Ω			
R24	1000Ω			
R25	47K			
R26	2.2meg			
R27	220K			
R28	330Ω 2W			
R29	330Ω 2W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA OLSON PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	RF Choke (.24uh)			4584	RTC-8512	T957	
L2	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L3	FM RF						
L4	FM Osc.						
L5	RF Choke (1uh)		BC-561	4602	RTC-8515	T855	
L6	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L7	1st FM IF		FM-256	1463-PC	RTC-9046	T654	
L8	2nd FM IF		FM-256	1463-PC	RTC-9046	T654	
L9	3rd FM IF		FM-256	1463-PC	RTC-9046	T654	
L10	Discriminator			1464-PC	RTC-9050	T658	
L11	AM Ant.		BC-380	43-A	RTC-8717	T500	
L12	AM Osc.		BC-393	69-OSC	RTC-8646	T512	
L13	1st AM IF		BC-356	13-PC1	RTC-8641	T614	
L14	2nd AM IF		BC-357	13-PC2	RTC-8642	T615	
L15	Fil. Choke (1.5uh)		BC-562	4604	RTC-8516	T856	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA OLSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V Ⓐ .4A	260VCT Ⓐ .050A DC	6.3V Ⓐ .6A						
	SEC. 3	SEC. 4	SEC. 5						
	6.3V Ⓐ 2.6A								

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA OLSON PART No. FUSE	OLSON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1		1A 250V						

PARTS LIST AND DESCRIPTIONS (Continued)

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		OLSON PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	OA79			1N295	1N295	Discriminator (Pigtail)
M3	OA79			1N295	1N295	
M4	OA79			1N295	1N295	AM Detector (Pigtail)

MISCELLANEOUS

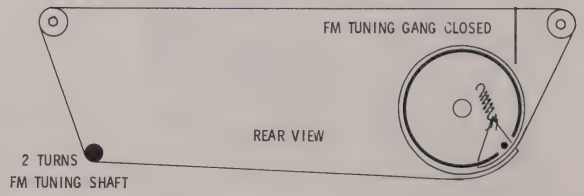
ITEM No.	PART NAME	OLSON PART No.	NOTES
M5	Tuning Cap.		FM, 2 Gang
M6	Tuning Cap.		AM, 2 Gang (Ant. 28—475mmf, Osc. 36—195mmf)
M7	Switch		Function Selector (Includes Off-On, Rotary Type)

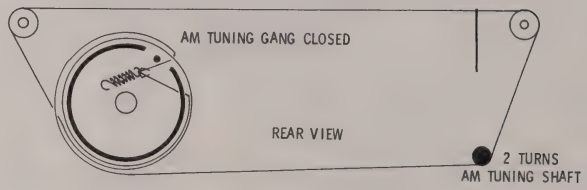
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

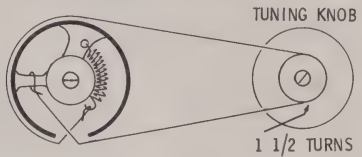
DIAL CORD STRINGING





DRIVE CORD STRINGING

TUNING GANG FULLY COUNTER CLOCKWISE



FRONT VIEW

TRADE NAME	Petite Model NTR-150
IMPORTER	Sterling Hi-Fidelity, Inc., 22-14 40th Ave., Long Island City 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	7MA @ 9 Volts DC (No Signal, Min. Volume) 15MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	532 — 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

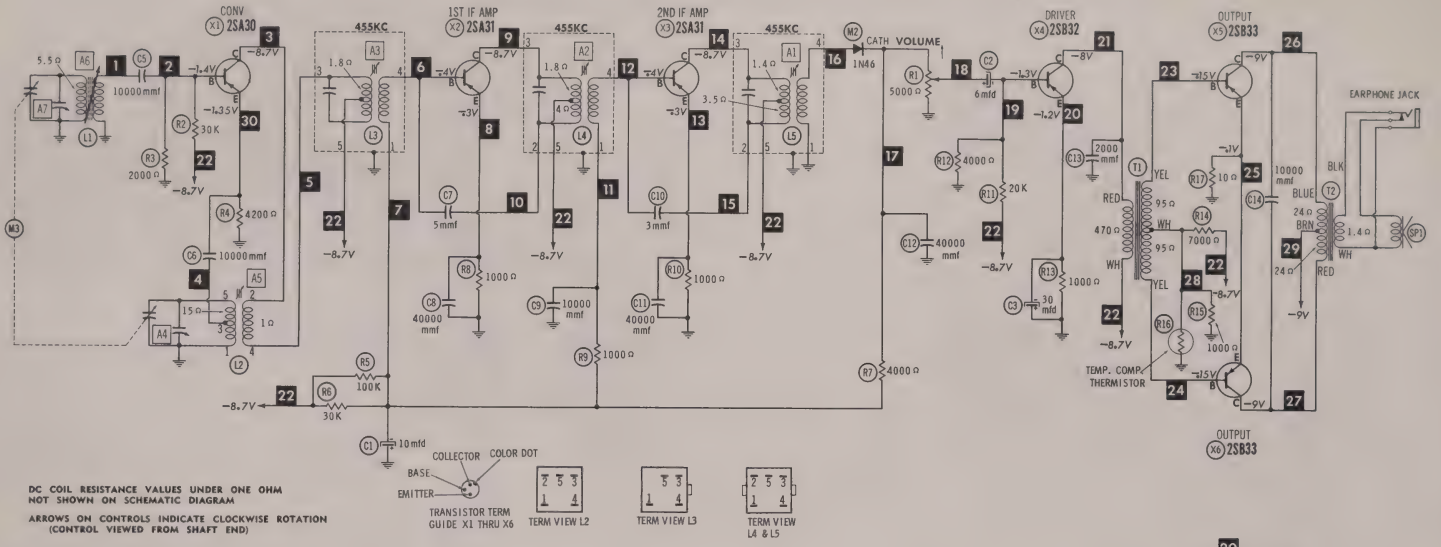
Suggested Alignment Tools: A1, A2, A3, A5...GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A7.....GENERAL CEMENT #5000, 5003, 5086, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

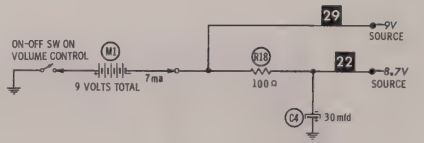
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5, A6	"
4.	"	1400KC	1400KC	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF464

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

©Howard W. Sams & Co., Inc. 1961

PETITE MODEL NTR-150

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA30	Converter	2N412			PNP
X2	2SA31	1st IF Amplifier	2N410			PNP
X3	2SA31	2nd IF Amplifier	2N410			PNP
X4	2SB32	Driver	2N406			PNP
X5	2SB33	Output	2N408			PNP
X6	2SB33	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	PETITE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	3		PTT-3010	NLW10-6	TT3X10	MLV10-3	TE-1053	
C2	5	5		PTT-6005	NLW5-15	TT10X6	MLV5-6	TE-1085	
C3	30	6		PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C4	30	10		PTT-10030	NLW30-15	TT15X30	MLV25-10	TE-1118	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C6	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C7	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C8	40000							
C9	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C10	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C11	40000							
C12	40000							
C13	2000		C80V202AM	DM-202	BYA10D2	CCD-202	B-220	5HK-D20
C14	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PETITE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10						Volume & Switch

RESISTORS

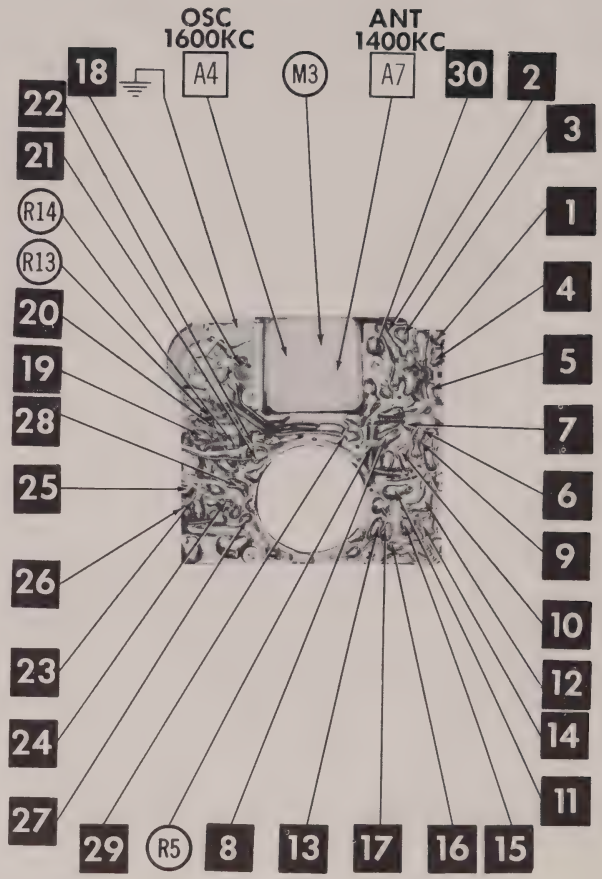
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	30K			
R3	2000Ω			
R4	4200Ω			
R5	100K			
R6	30K			
R7	4000Ω			
R8	1000Ω			
R9	1000Ω			
R10	1000Ω			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R11	20K			
R12	4000Ω			
R13	1000Ω			
R14	7000Ω			
R15	1000Ω			
R16	Temp. Comp.			
R17	10Ω			
R18	100Ω			

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PETITE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Oscillator						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PETITE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.6	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PETITE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	700Ω CT	6-8Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PETITE PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω			

BATTERIES

ITEM No.	VOLTAGE	PETITE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		PETITE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N46			1N60	1N60	Detector

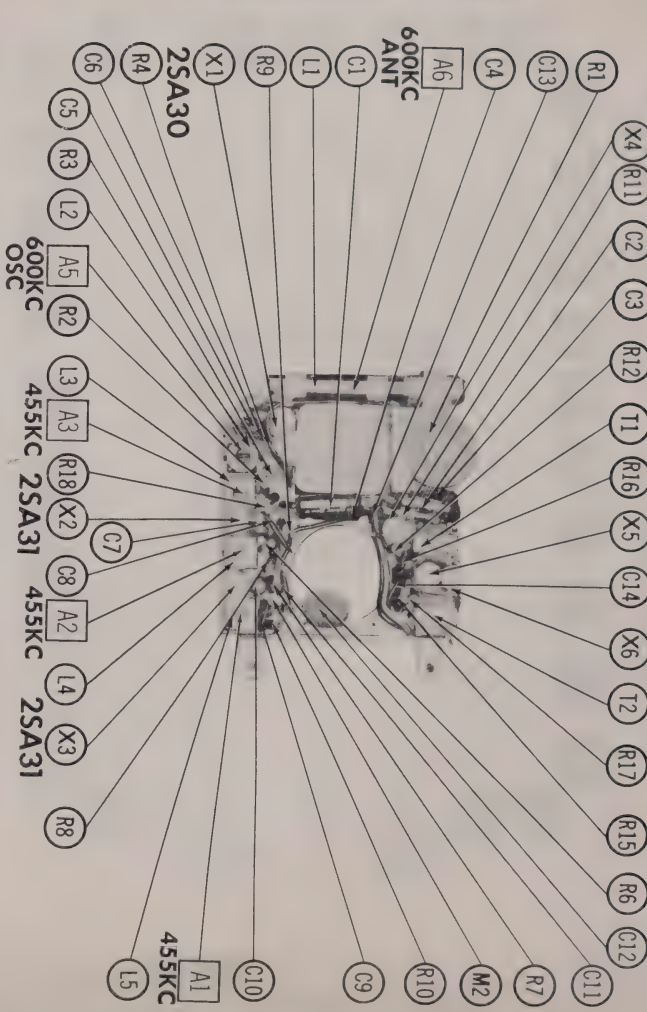
MISCELLANEOUS

ITEM No.	PART NAME	PETITE PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

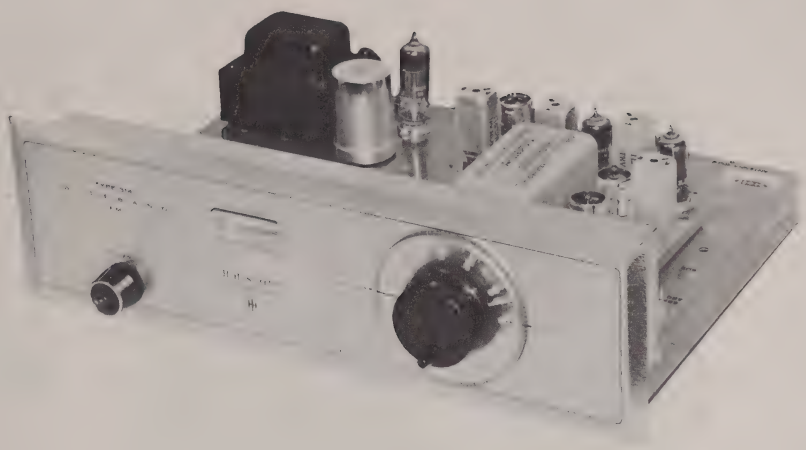
CHASSIS—TOP VIEW



PHOTOFACT® Folder

**H. H. SCOTT
MODEL 314**

H. H. SCOTT
MODEL 314



H. H. SCOTT
MODEL 314

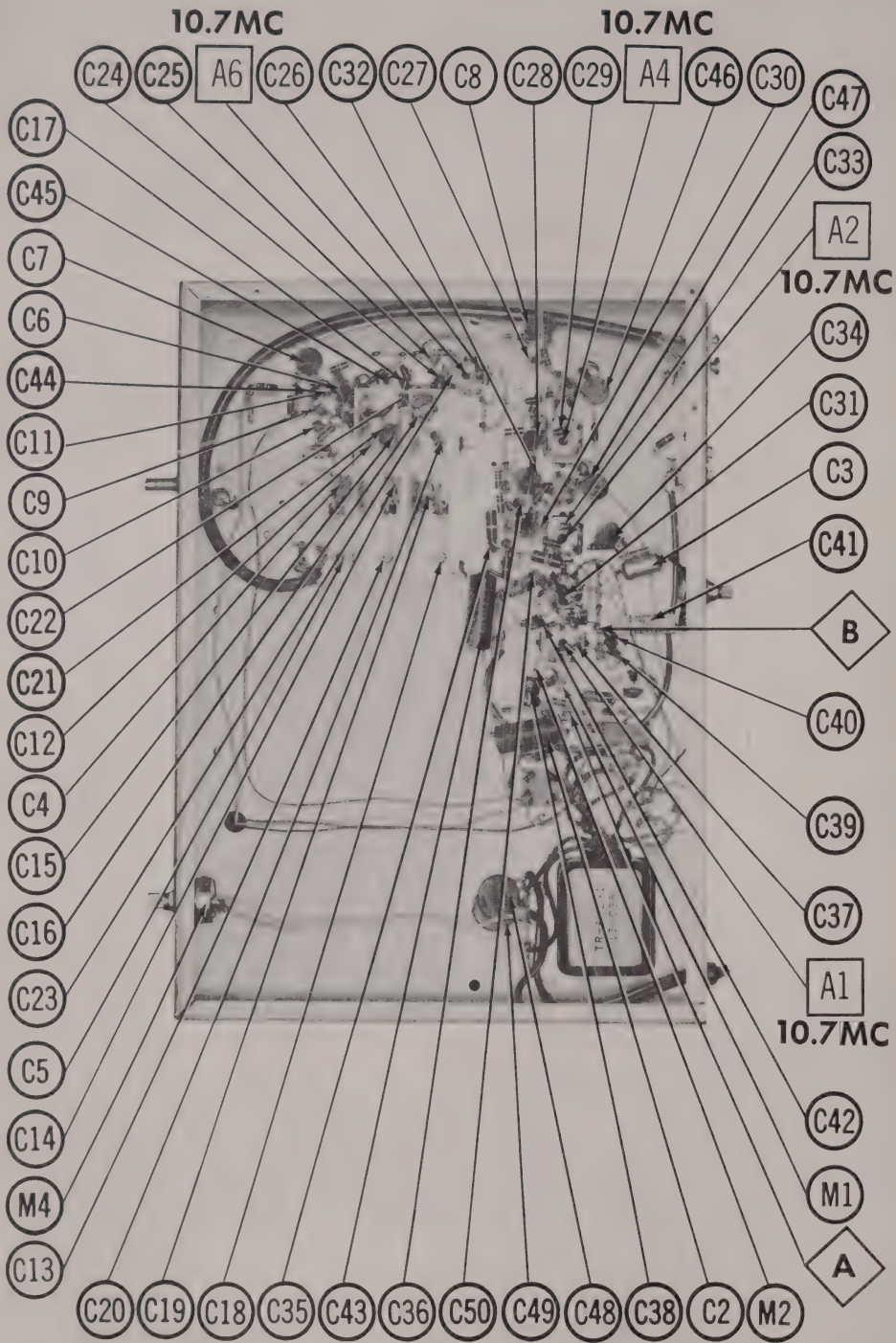
TRADE NAME	H.H. Scott Model 314
MANUFACTURER	Hermon Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass.
TYPE SET	AC Operated 7 Tube FM Tuner
POWER SUPPLY	105 – 125 Volts AC, 50-60 Cycles RATING 32 Watts, .29 Amp. @117 Volts AC
TUNING RANGE–FM	88 – 108 MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

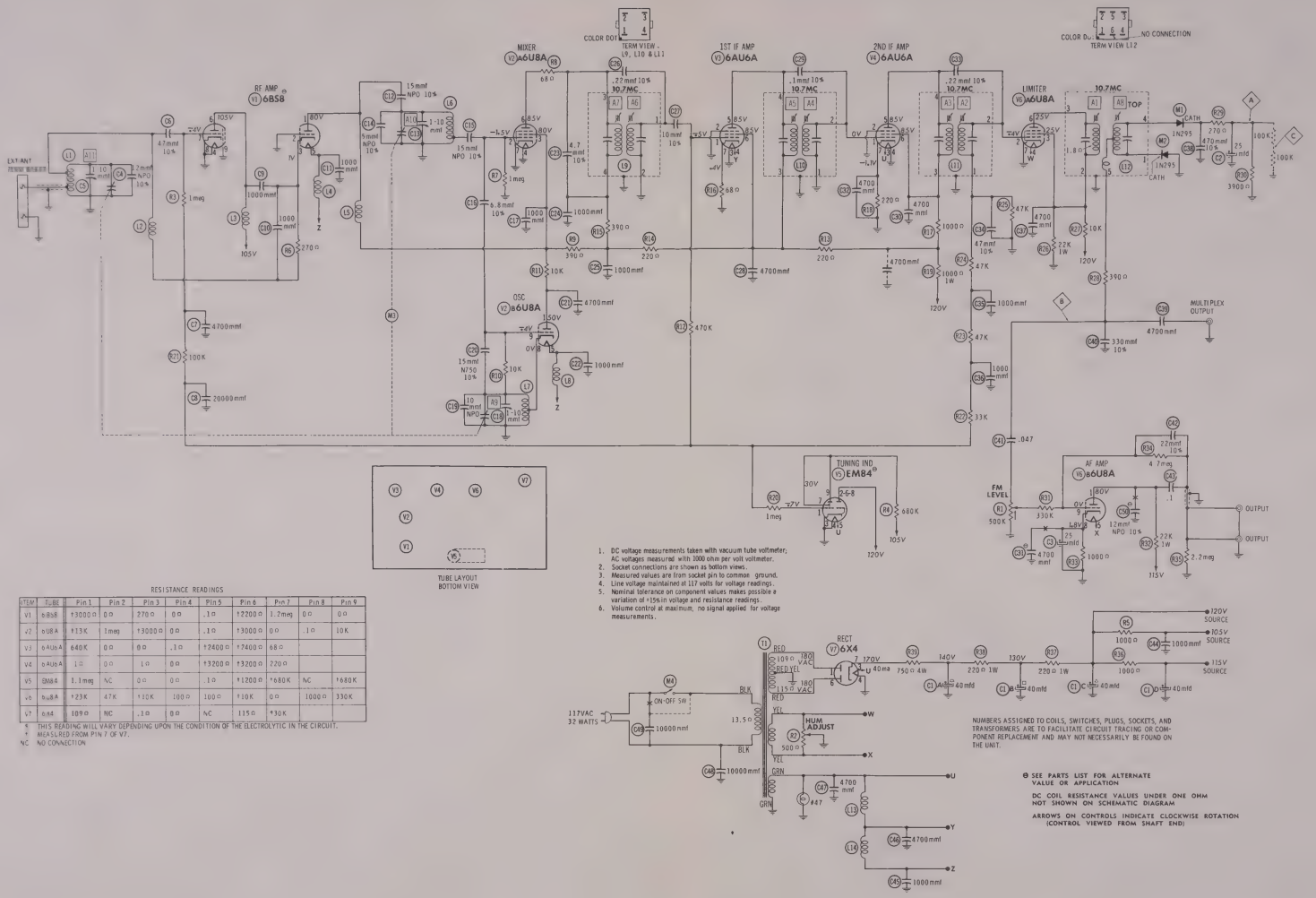
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KJ535

SET 534 FOLDER 11



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.



TUBE LAYOUT
BOTTOM VIEW

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	†3000Ω	0Ω	270Ω	0Ω	.1Ω	†2200Ω	1.2meg	0Ω	0Ω
V2	6U8A	†13K	1meg	†3000Ω	0Ω	.1Ω	†3000Ω	0Ω	.1Ω	10K
V3	6AU6A	640K	0Ω	0Ω	.1Ω	†2400Ω	†7400Ω	68Ω		
V4	6AU6A	1Ω	0Ω	1Ω	0Ω	†3200Ω	†3200Ω	220Ω		
V5	6M84	1.1meg	NC	0Ω	0Ω	1Ω	†1200Ω	†680K	NC	†680K
V6	6U8A	†23K	47K	†10K	100Ω	100Ω	†10K	0Ω	1000Ω	330K
V7	6X4	109Ω	NC	.1Ω	0Ω	NC	115Ω	†30K		

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V7.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

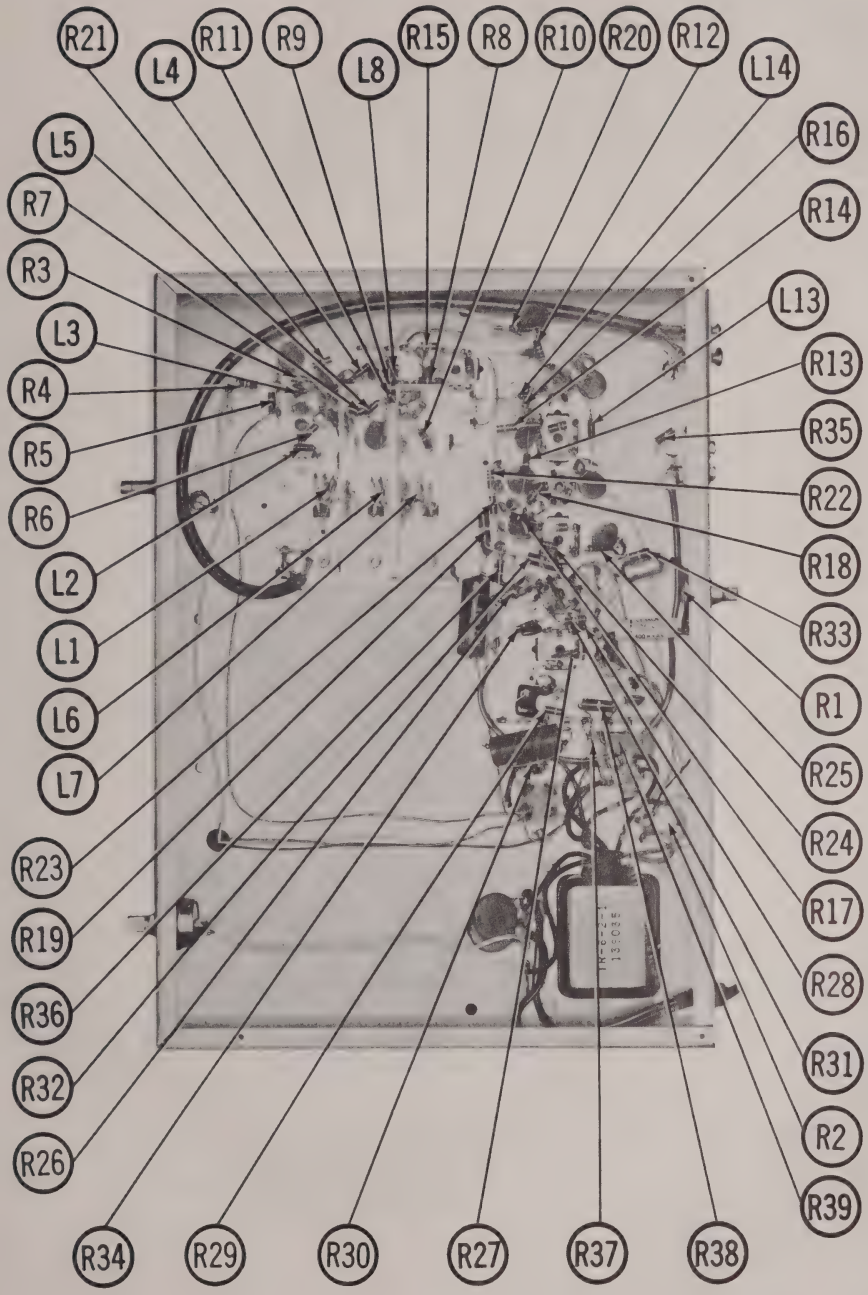
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1961

H. H. SCOTT
MODEL 314



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A8..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A9, A10, A11.....GENERAL CEMENT #8721, 8722
WALSCO #2519

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (± 1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	Across antenna terminals.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for maximum deflection.
2.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5, A6, A7	Disconnect Stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
2.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A8	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of cross-over lines.

RF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Across Antenna Terminals with 120Ω in each lead.	106MC (Unmod.)	106MC	DC probe to point Ⓐ. Common to chassis.	A9, A10, A11	Adjust for maximum deflection.
4.	"	90MC	90MC	"	L7, L6, L1	Adjust for maximum deflection. Repeat Steps 3 and 4.

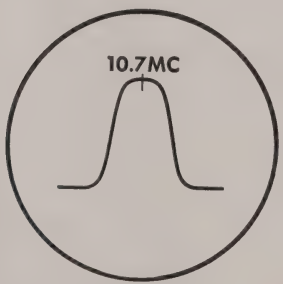


FIG. 1

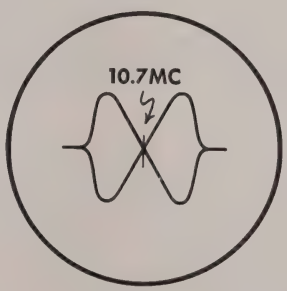


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC)
V1	RF Amplifier	6BS8 (6BQ7A) *
V2	Mixer - Osc.	6U8A
V3	1st IF Amplifier	6AU6A
V4	2nd IF Amplifier	6AU6A

ITEM No.	USE	TYPE (• RAYTHEON • SYLVANIA •)
V5	Tuning Indicator	EM84 (6FG6) *
V6	Limiter-AF Amp.	6U8A
V7	Rectifier	6X4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	250	CEC-4X40/250	AFH4-01-70		WP412.8	TMQ-4104	TVLS-4538*	
B	■40	250							
C	▲40	250							
D	40	250							
C2	25	25	CET25/25	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	
C3	25	25	CET25/25	PTT-25025	NLW25-25	TT25X25	MLV25-25	TE-1207	

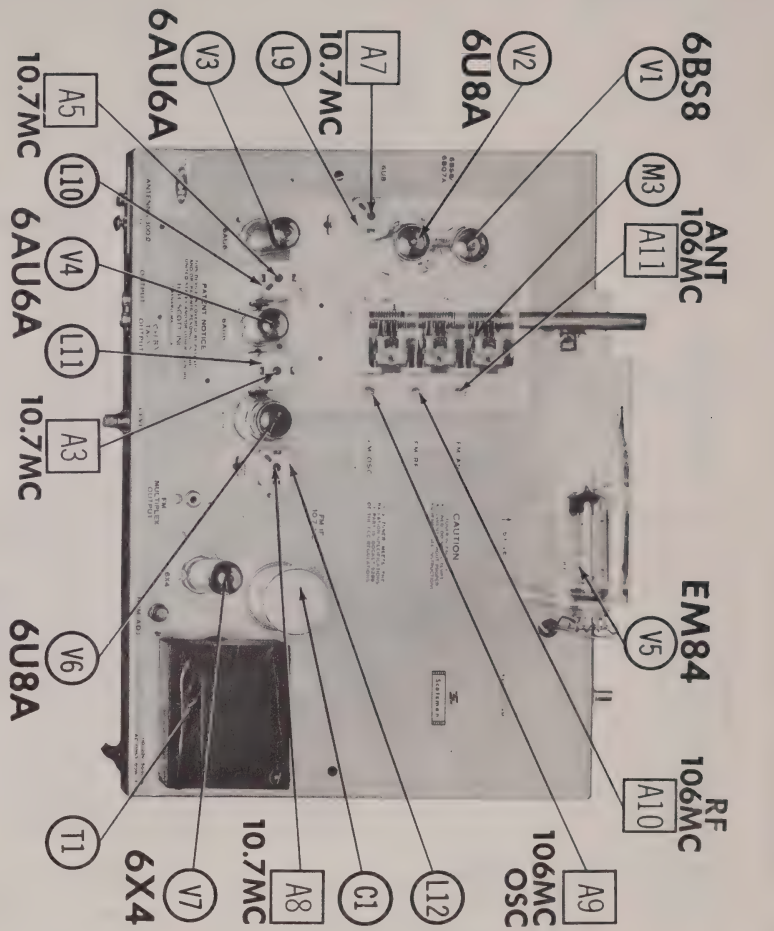
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	12 NPO 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C5	1-10			829-10				
C6	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C7	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-100	CNO-415	10TCC-Q15
C13	1-10			829-10				
C14	5 NPO 5%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C15	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C16	6.8 10%		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C17	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	1-10			829-10				
C19	10 NPO		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C20	15 N750 10%		N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C21	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C22	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C24	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C25	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C26	.22 10%							
C27	10 10%		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C28	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C29	.1 10%							
C30	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C31	4700	Note 1	BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C32	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C33	.22 10%							
C34	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C35	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C36	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C37	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C38	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C39	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	330 10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C41	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C42	22 10%		1469-000022	TCZ-22	22R5Q22	CM-19B-220K	CNO-422	MS-422
C43	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C44	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

CHASSIS—TOP VIEW



H. H. SCOTT
MODEL 314

FOLDER 11

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C46	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C47	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C48	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	12 NPO 10%	Note 1		TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q10

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	RCV-500K-P	BX-59	A47-500K-S	Bil-133	SU-50	FM Level
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R2A	500Ω	½	RCV-500-S	AB-4	A47-500-S	Bil-103	U2	Hum Adjust
B	Shaft			AK-1	FKS-1/4	SK6	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R3	1meg			
R4	680K			
R5	1000Ω			
R6	270Ω			
R7	1meg			
R8	68Ω			
R9	390Ω			
R10	10K			
R11	10K			
R12	470K			
R13	220Ω			
R14	220Ω			
R15	390Ω			
R16	68Ω			
R17	1000Ω			
R18	220Ω			
R19	1000Ω 1W			
R20	1meg			
R21	100K			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R22	33K			
R23	47K			
R24	47K			
R25	47K			
R26	22K 1W			
R27	10K			
R28	390Ω			
R29	270Ω			
R30	3900Ω			
R31	330K			
R32	22K 1W			
R33	1000Ω			
R34	4.7meg			
R35	2.2meg			
R36	1000Ω			
R37	220Ω 1W			
R38	220Ω 1W			
R39	750Ω 4W	PW4-750	4W-SQ-750	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		H. H. SCOTT PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant.						
L2	RF Choke (1.2uh)		BC-561	4602	RTC-8515	T855	
L3	RF Choke (.33uh)			4586			
L4	Fil. Choke (1uh)		BC-561	4602	RTC-8515	T855	
L5	RF Choke (1uh)		BC-561	4602	RTC-8515	T855	
L6	RF						
L7	Osc.						
L8	Fil. Choke (1uh)		BC-561	4602	RTC-8515	T855	
L9	1st IF		FM-254	1463	RTC-8599	T633	
L10	2nd IF		FM-254	1463	RTC-8599	T633	
L11	3rd IF		FM-254	1463	RTC-8599	T633	
L12	Ratio Detector		FM-255	1465	RTC-8600	T635	
L13	Fil. Choke (1uh)		BC-561	4602	RTC-8515	T855	
L14	Fil. Choke (1uh)		BC-561	4602	RTC-8515	T855	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	H. H. SCOTT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ⓐ .29A	360VCT ⓐ .040A DC	6.3V ⓐ .45A	TR 6-2-1			22R38 ⓘ 21F21 ⓘ		ⓘ Drill New Mounting Holes.
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ⓐ 2.7A								

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		H. H. SCOTT PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M1	1N294			1N295	1N295	Detector (Pigtail)
M2	1N294			1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	H. H. SCOTT PART No.	NOTES
M3	Tuning Cap.		3 Gang
M4	Switch		Power Off-On

WIRING DATA

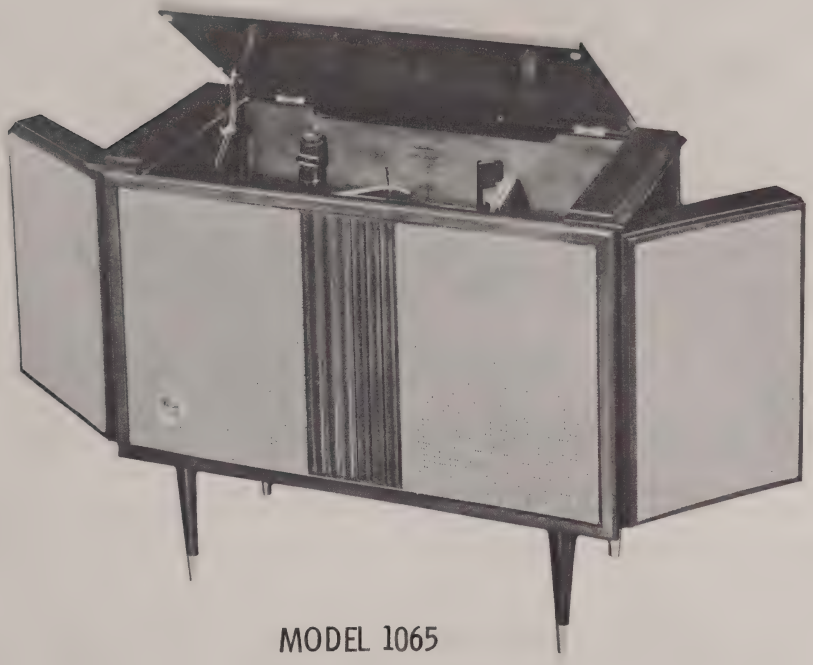
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

**SILVERTONE MODELS 1065, 1067
(Ch. 528.54050, 528.59840)**

SILVERTONE MODELS 1065, 1067
(Ch. 528.54050, 528.59840)



MODEL 1065

SILVERTONE MODELS 1065, 1067
(Ch. 528.54050, 528.59840)

TRADE NAME	Silvertone Models 1065, 1067 (Tuner Ch. 528.54050, Amp. Ch. 528.59840)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated 9 Tube FM-AM Tuner, 4 Tube Stereo Amplifier And 4 Speed Automatic Record Changer		
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles	RATING	105 Watts, .95 Amp. @117 Volts AC (AM or FM)
TUNING RANGE—BROADCAST	540 — 1600KC	FREQ. MOD.	88 — 108MC

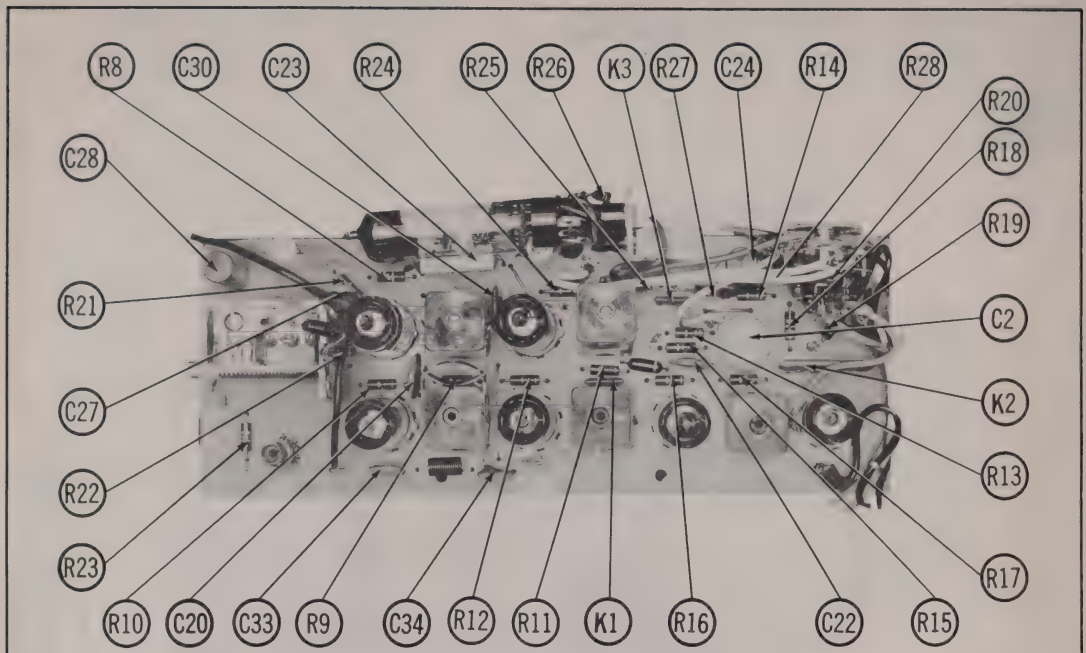
FOR SERVICE INFORMATION ON RECORD CHANGER 528.57351 — SEE PHOTOFACT SET 515 FOLDER 16

SET 534 FOLDER 12

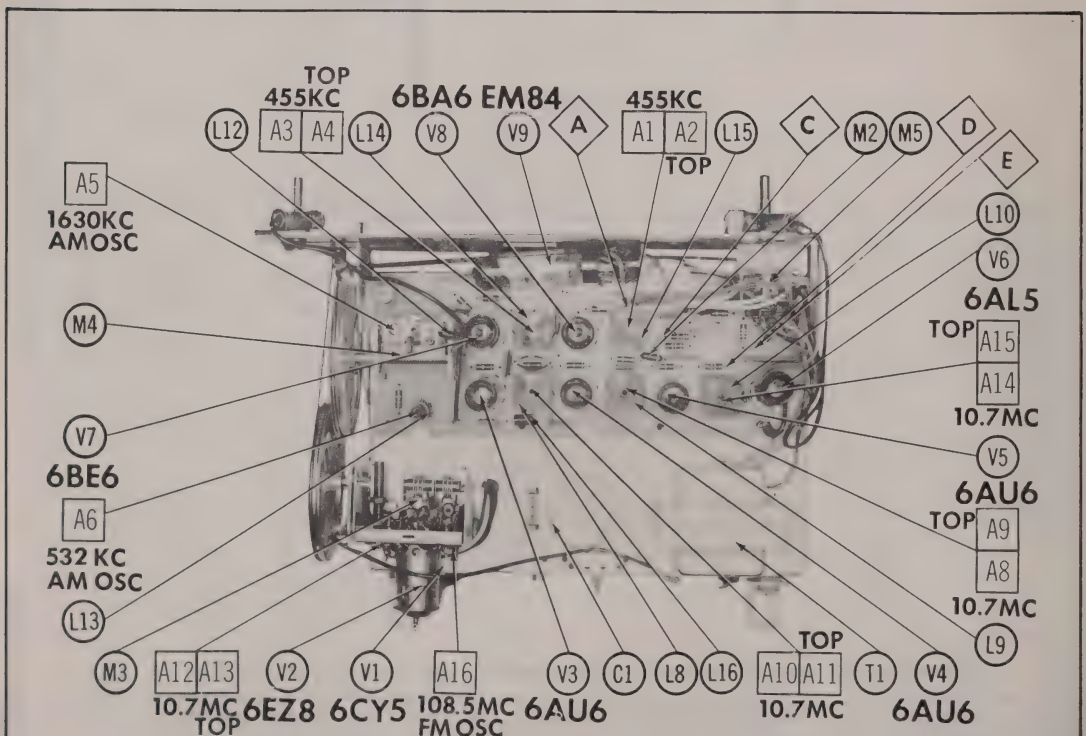
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KN539

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



TUNER PRINTED BOARD — TOP VIEW



TUNER CHASSIS — TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 thru A4, A12, A13.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6, A8 thru A11, A14, A15...GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A16.....GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (Unmod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1630KC	Tuning gang fully open.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	532KC	Tuning gang fully closed.	"	A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum deflection. Repeat Steps 2, 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM–SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .001mfd to point Ⓑ. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓒ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	"
7.	"	"	"	DC probe to point Ⓔ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE – SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .001mfd to point Ⓑ. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. Amp. to point Ⓒ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A14	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
7.	"	"	"	Vert. amp. to point Ⓔ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 120Ω in each lead.	108.5MC (Unmod.)	(FM) Tuning gang fully open.	DC probe to point Ⓒ. Common to chassis.	A16	Adjust for maximum deflection.
9.	"	87.5MC	Tuning gang fully closed.	"	L6	"

FIG. 1

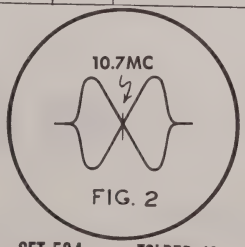
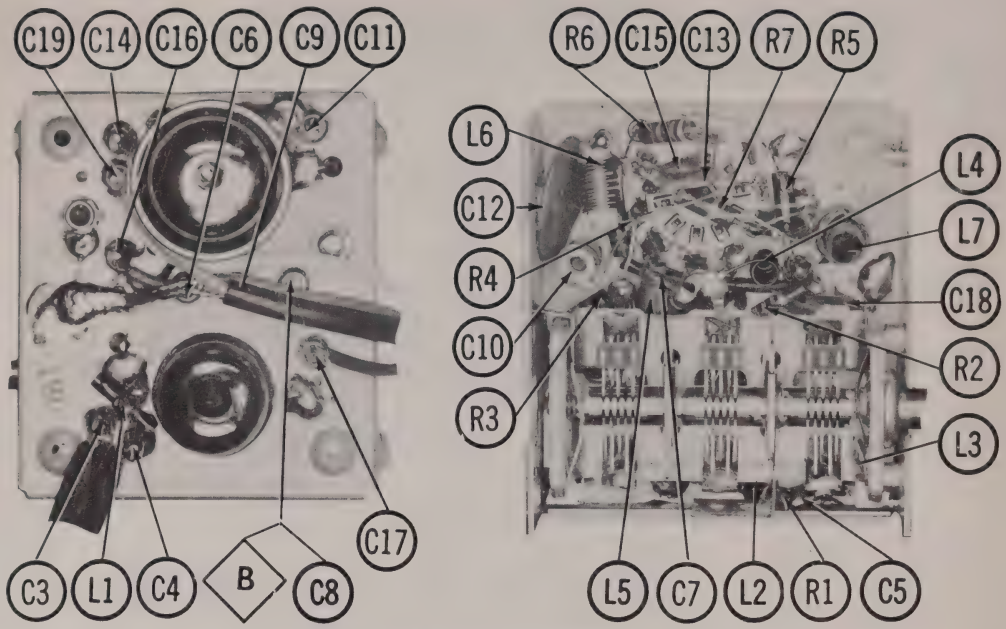
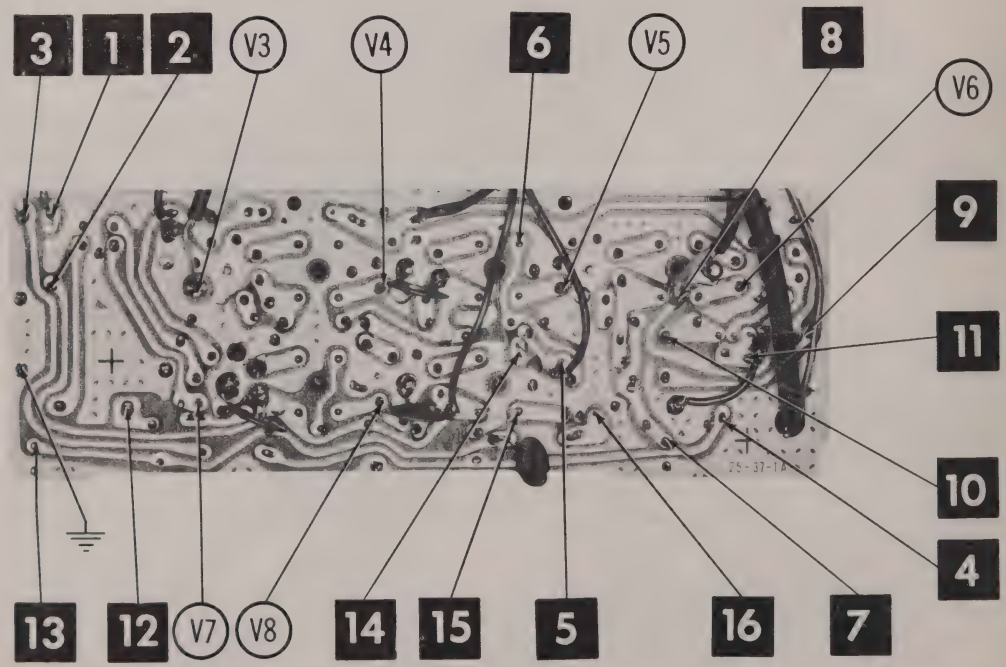


FIG. 2



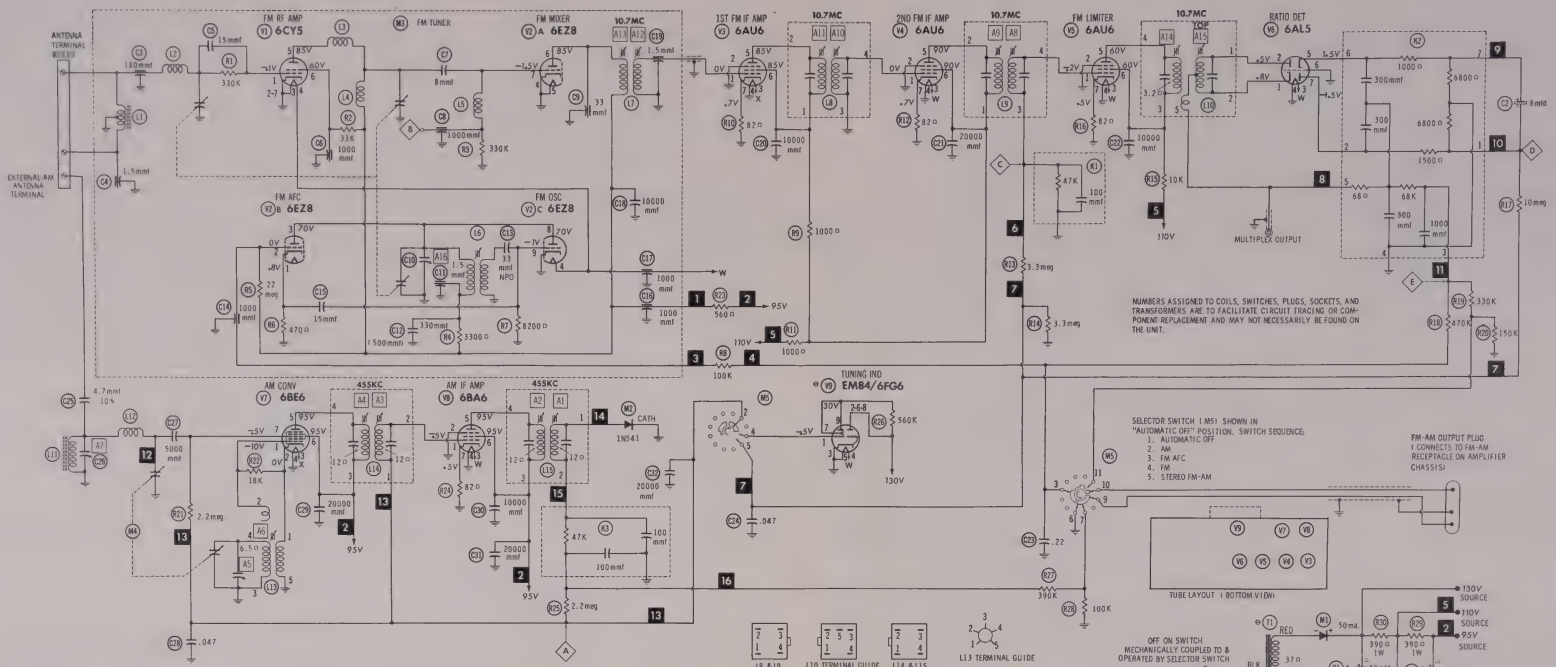
FM RF SUBCHASSIS



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED


ANTENNA TERMINAL
EXTERNAL AM ANTENNA TERMINAL
FM RF AMP V1 6CY5
M1 FM TUNER
FM MIXER V2 A 6EZ8
10.7MC
1ST FM IF AMP V3 6AU6
2ND FM IF AMP V4 6AU6
FM LIMITER V5 6AU6
RATIO DET V6 6AL5
FM AFC V2 B 6EZ8
FM OSC V2 C 6EZ8
AM CONV V7 6BE6
455KC
AM IF AMP V8 6BA6
TUNING IND V9 EM84/6FG6
MULTIPLEX OUTPUT
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SELECTOR SWITCH (M5) SHOWN IN "AUTOMATIC OFF" POSITION. SWITCH SEQUENCE:
1. AUTOMATIC OFF
2. AM
3. FM AFC
4. FM
5. STEREO FM-AM
FM-AM OUTPUT PLUG (CONNECTS TO FM-AM RECEPTACLE ON AMPLIFIER CHAS515)
TUBE LAYOUT (BOTTOM VIEW)
OFF ON SWITCH MECHANICALLY COUPLED TO & OPERATED BY SELECTOR SWITCH
117VAC - 105 WATTS (AM OR FM) 66 WATTS (PHONO-LESS MOTOR)
AMPLIFIER POWER SOCKET
L8 & L9 TERMINAL GUIDE
L10 TERMINAL GUIDE
L14 & L15 TERMINAL GUIDE
L13 TERMINAL GUIDE
110V SOURCE
95V SOURCE

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	330K	0Ω	0Ω	.1Ω	†1300Ω	†34K	0Ω		
V2	6EZ8	470Ω	1meg =100K	†4600Ω	0Ω	.1Ω	†1300Ω	330K	†4600Ω	8200Ω
V3	6AU6	.1Ω	0Ω	.1Ω	0Ω	†2400Ω	†2400Ω	82Ω		
V4	6AU6	.1Ω	0Ω	.1Ω	0Ω	†1400Ω	†1400Ω	82Ω		
V5	6AU6	47K	0Ω	.1Ω	0Ω	†10K	†10K	82Ω		
V6	6AL5	550K	550K	.1Ω	0Ω	7800Ω	0Ω	8300Ω		
V7	6BE6	18K	.8Ω	.1Ω	0Ω	†780Ω	†780Ω	4.8meg		
V8	6BA6	2.6meg	0Ω	.1Ω	0Ω	†780Ω	†780Ω	82Ω		
V9	EM84 & 6FG6	2.2meg	NC	0Ω	0Ω	.1Ω	†0Ω	†560K	NC	†560K

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM OUTPUT OF M1.
■ MEASURED WITH "AFC" OFF. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®
© Howard W. Sams & Co., Inc. 1961

SILVERTONE MODELS 1065, 1067 (Ch. 528.54050, 528.59840)

TUNER SCHEMATIC

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp.	6CY5	V6	Ratio Det.	6AL5
V2	FM Mixer-Osc. -AFC	6EZ8	V7	AM Conv.	6BE6
V3	1st FM IF Amp.	6AU6	V8	AM IF Amp.	6BA6
V4	2nd FM IF Amp.	6AU6	V9	Tuning Indicator	EM84/6FG6
V5	FM Limiter	6AU6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	18-57-3	AFH4-35	D0320	FP311,68	TMT-3304	TVL-3583	
B	■60	150							
C	●60	150							
C2	8	50	18-98-5	PRS1405	BBR8-150	TC41	TD-8-150	TVA-1405	

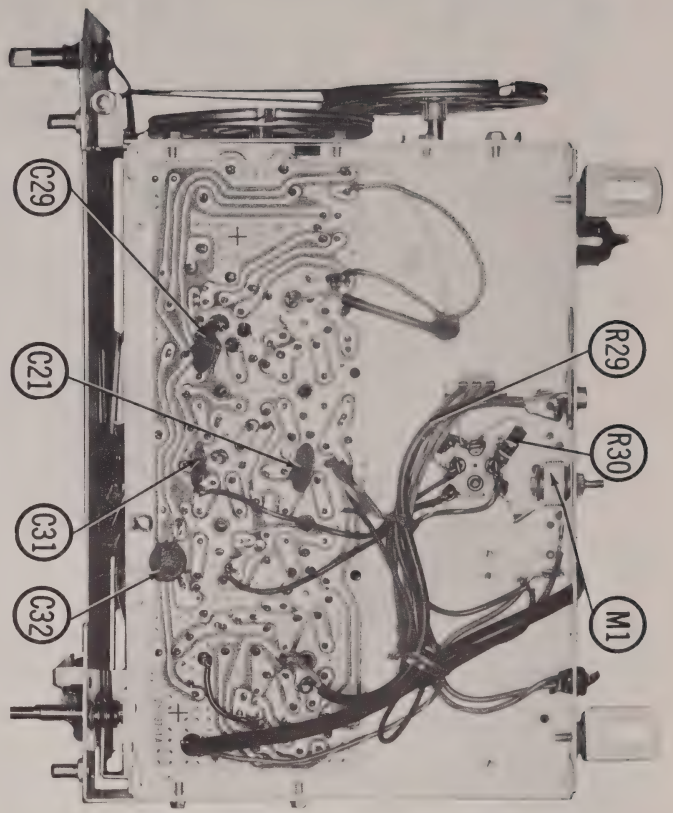
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	180	#277-181						
C4	1.5	#274-159						
C5	15		DI-15	DD-150	L10Q15	CCD-150	GP415	10TS-Q15
C6	1000		EF-001	MFT-1000		CCF-102	CT280A	
C7	8		NPO-DI 8.2		C10V8C			10TCC-V82
C8	1000		EF-001	MFT-1000		CCF-102	CT280A	
C9	33	#275-330						
C10		#1620-12						
C11	1.5	#274-159						
C12	330	(500) †	DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C13	33 NPO		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C14	1000		EF-001	MFT-1000		CCF-102	CT280A	
C15	15		DI-15	DD-150	L10Q15	CCD-150	GP415	10TS-Q15
C16	1000		EF-001	MFT-1000		CCF-102	CT280A	
C17	1000		EF-001	MFT-1000		CCF-102	CT280A	
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	1.5	#274-159						
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.22 100V		P288N-22		CUB2P22	1DP-3-224	GEM-2022	2TM-P22
C24	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C25	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C26		#19-180-0						
C27	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C28	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C29	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C32	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C33	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C34	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

Silvertone Part Number.
† Alternate Value.

TUNER CHASSIS—BOTTOM VIEW



TUNER PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	330K			
R2	33K			
R3	330K			
R4	3300Ω			
R5	22meg			
R6	470Ω			
R7	8200Ω			
R8	100K			
R9	1000Ω			
R10	82Ω			
R11	1000Ω			
R12	82Ω			
R13	3.3meg			
R14	3.3meg			
R15	10K			
R16	82Ω			
R17	10meg			
R18	470K			
R19	330K			
R20	150K			
R21	2.2meg			
R22	18K			
R23	560Ω			
R24	82Ω			
R25	2.2meg			
R26	560K			
R27	390K			
R28	100K			
R29	390Ω 1W			
R30	390Ω 1W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	FM Diode Filter	100mmf, 47K	13-3-2	
K2	Ratio Detector Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω 1500Ω, (2) 6800Ω, 68K	13-35-3	Aerovox PA-694 Centralab PC-342 Sprague C-12
K3	AM Diode Filter	(2) 100mmf, 47K	13-2-2	Aerovox PA-97 Centralab PC-50 Sprague D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	FM Ant.	3191-1					
L2	RF Choke	301-15					
L3	RF Choke	300-7					
L4	RF Choke	301-11					
L5	RF Choke	3190-24					
L6	FM Osc.	3197-2					
L7	1st FM IF	3193-1					
L8	2nd FM IF	10-117-2	FM-256	1463-PC	RTC-9046	T654	
L9	3rd FM IF	10-118-2	FM-256	1463-PC	RTC-9046	T654	
L10	Ratio Detector	10-29-0	FM-257	1465-PC	RTC-9053	T659	
L11	Loopstick	82-151-0	BC-418	705-A		T532	
L12	RF Choke (2.2uh)	10-140-1	BC-563	4606	RTC-8517	T857	
L13	AM Osc.	10-55-4					
L14	1st AM IF	10-116-2	BC-356	13-PC1	RTC-8641	T614	
L15	2nd AM IF	10-116-2	BC-357	13-PC2	RTC-8642	T615	
L16	RF Choke	10-28-0					

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ .25A	120V @ .050A DC	6.3V @ 3A	C80-47-0E ①					① Alternate Part # 80-47-0

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: SILVERTONE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.050A	86-22-3 *	1N1763 ♦	65 *	SR200 ♦	* Selenium Type ♦ Silicon Type

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: SILVERTONE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N541			1N295	1N295	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	FM Tuner	95-230-0	Complete (Includes Tuning Gang, Part #3400-502)
M4	Tuning Cap.	19-84-2	AM, 2 Gang
M5	Switch	69-340-0	Selector (Rotary Wafer Type)

CABINETS & CABINET PARTS

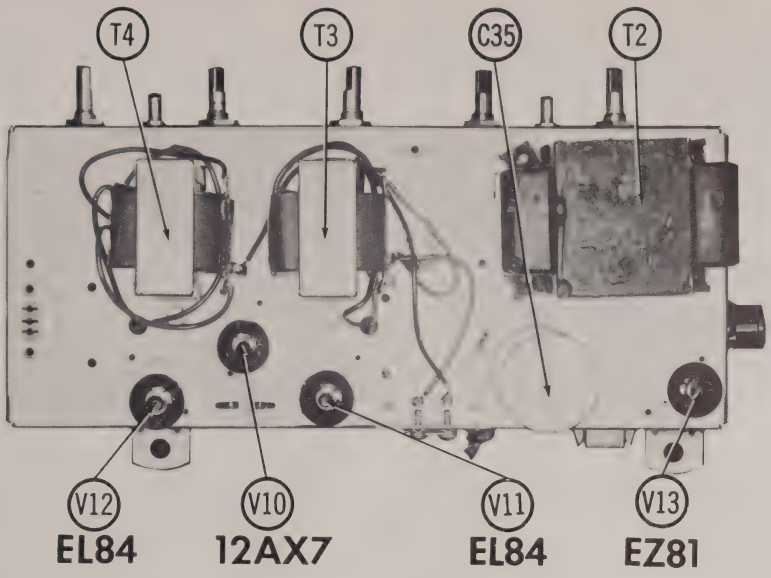
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Window	67-689-0	
Dial Pointer	52-215-1	
Knob	52-1109-0	Tuning, FM
Knob	52-1385-0	Tuning, AM
Knob	52-1381-0	Tuner Function Selector
Knob	52-1388-0	Loudness, Bass, Treble, Balance, Function Selector
Cabinet	42-142-3	Model 1065
Cabinet	42-144-3	Model 1067
Speaker Cabinet	42-61-4	Left, Model 1065
Speaker Cabinet	42-63-4	Left, Model 1067
Speaker Cabinet	42-58-4	Right, Model 1065
Speaker Cabinet	42-60-4	Right, Model 1067
Leg	49-635	Cabinet, Model 1065
Leg	49-637	Cabinet, Model 1067

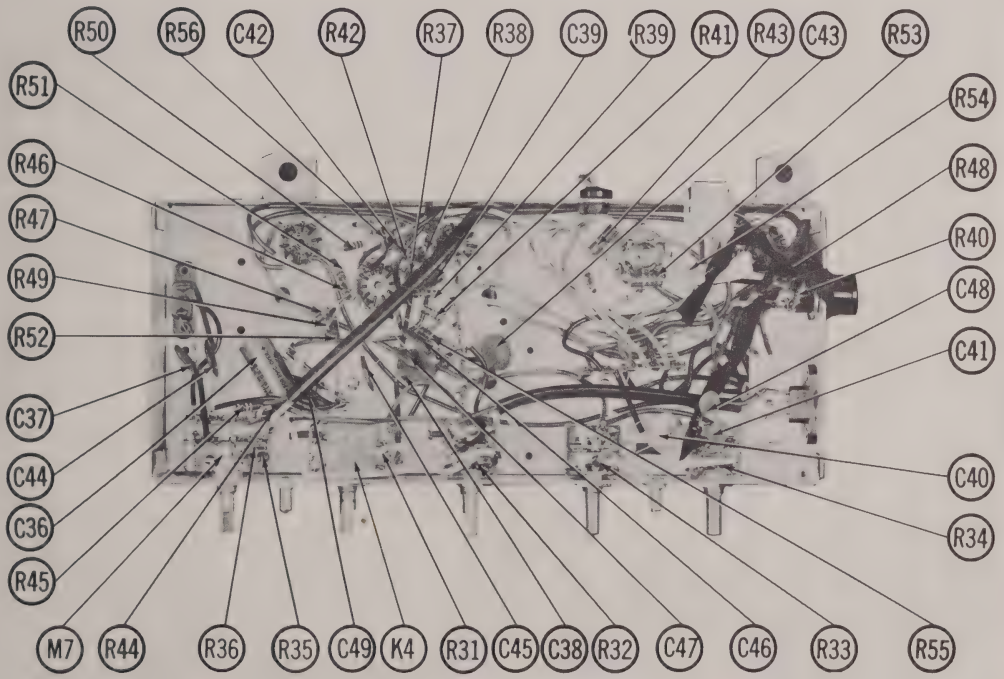
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



AMP CHASSIS – TOP VIEW



AMP CHASSIS – BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V10	Main Channel AF Amp. - Stereo Channel AF Amp.	12AX7
V11	Main Channel Output	EL84/6BQ5
V12	Stereo Channel Output	EL84/6BQ5
V13	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C35A	●60	450	18-55-3		D0798. 2	FP375. 6	TMT-3709	TVL-4711. 3	Note 1
B	■40	450				TC78	TD-40-350		Note 1
C	▲40	350							Note 1
D	20	300							Note 1
C36	25	25	18-52-5	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	

NOTE 1. In some versions, C35A is 40mfd @ 350V, C35B and C35C are 40mfd @ 300V and C35D is 25mfd @ 25V(Part #18-59-3)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C37	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C38	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C39	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C40A	4000		BPD-2X004	DD-402	BYC6DD4	CCD-392	B-240	5HK-2D40
B	4000			DD-402		CCD-392	B-240	
C41	330 10%		DI-331	DD-331	L10T33	CCD-331	GP333	10TS-T33
C42	150		DI-150	DD-151	L10T15	CCD-151	B-315	10TS-T15
C43	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C44	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C46	150		DI-150	DD-151	L10T15	CCD-151	B-315	10TS-T15
C47	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C48	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C49	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R31A	2meg	½	24-414	BT-82				Loudness, Main Channel
	1meg Tap							
B	2meg	½		STR-82				Loudness, Stereo Channel
	1meg Tap							
R32A	2meg	½	24-415				FA26A	Balance, Main Channel
B	2meg	½					RU26R	Balance, Stereo Channel
C	Shaft						CS3500	
R33A	1meg	½	24-417	B-70	AD47-1meg-Z		FA16A	Treble, Main Channel
B	1meg	½		SR-70	Not Req.		RU16A	Treble, Stereo Channel
C	Shaft			Not Req.	FS-3		CS3500	
R34A	5meg	½	24-416	B-87	AD47-5meg-S		FA56L	Bass, Main Channel
B	5meg	½		SR-87	Not Req.		RU56L	Bass, Stereo Channel
C	Shaft			Not Req.	FS-3		CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REPLACEMENT DATA REMARKS
R35	820K			
R36	470K			
R37	4.7meg			
R38	270K			
R39	270Ω			
R40	10K			
R41	18K			
R42	470K			
R43	150Ω 1W			
R44	820K			
R45	470K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REPLACEMENT DATA REMARKS
R46	4.7meg			
R47	270Ω			
R48	10K			
R49	18K			
R50	470K			
R51	270K			
R52	150Ω 1W			
R53	2200Ω 1W			
R54	220Ω 3W	PW5-220	36-220	
R55	100Ω			
R56	100Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K4	Loudness Comp.	(2) 47mmf, (2) 5000mmf, (2) 100K	13-42-3	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	117V @ .7A	540VCT @ .100A DC	24V	C80-45-0B ①					① Alternate Part # 80-45-0
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 2.8A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	4800Ω	6-8Ω	B80-126-1C ①	A-2902	A-3849	24S64	S-54X	① Alternate Part #80-126-1
T4	4800Ω	6-8Ω	B80-126-1C ①	A-2902	A-3849	24S64	S-54X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	8"	PM	14-16Ω	33-464-4A	8A31Z16	
SP2	4"	PM	14-16Ω	33-463-4A	4A15Z16	
SP3	8"	PM	14-16Ω	33-464-4A	8A31Z16	
SP4	4"	PM	14-16Ω	33-463-4A	4A15Z16	

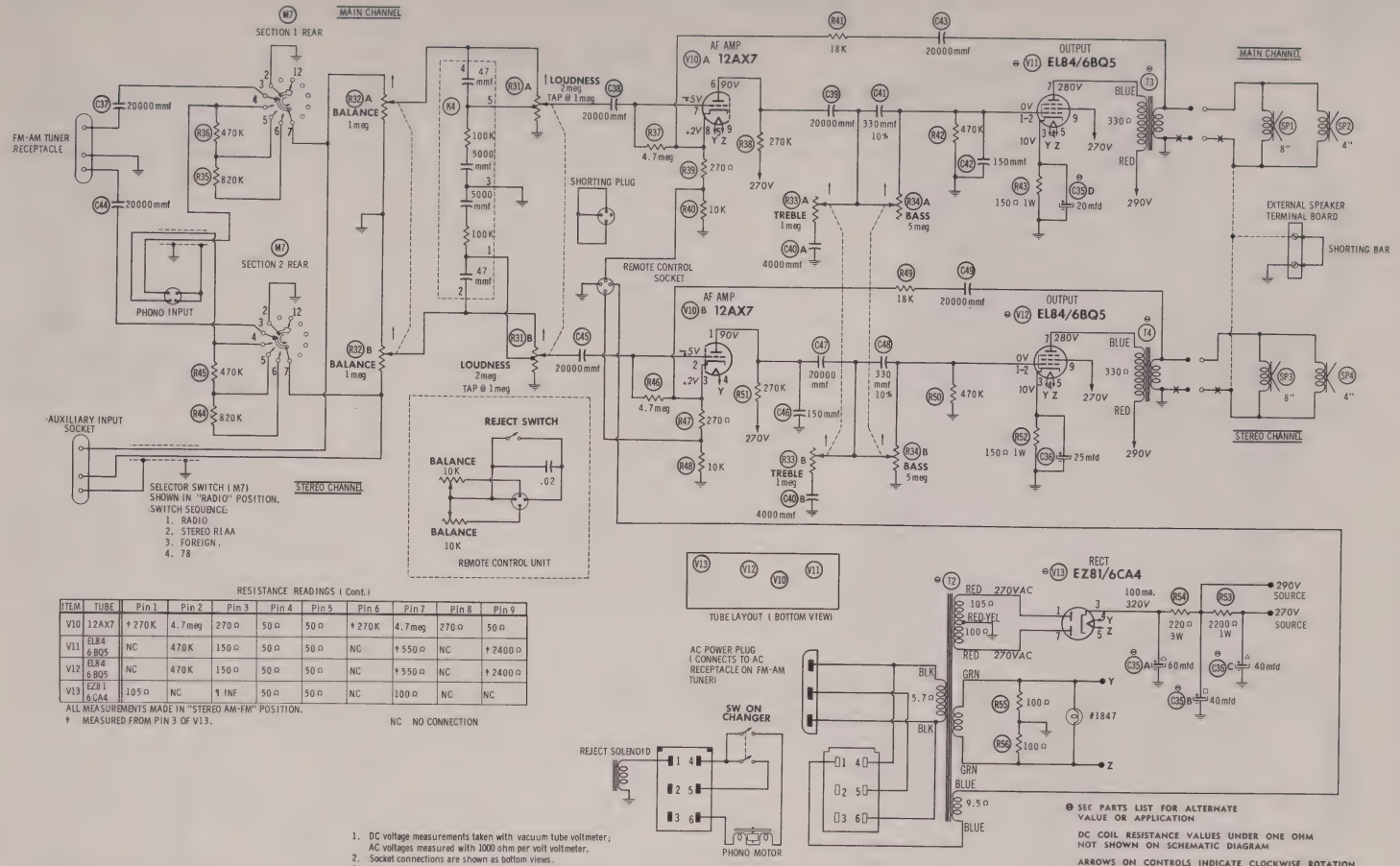
PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	SILVERTONE PART No. CARTRIDGE	SILVERTONE PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M6	33-314-0	83-1308 *	13TBX	Not Req.	26SD	Not Req.	8TA4-SD	N-8TA-SD *	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M7	Switch	69-329-0	Selector (Rotary Wafer Type)



RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V10	12AX7	†270K	4.7meg	270Ω	50Ω	50Ω	†270K	4.7meg	270Ω	50Ω
V11	EL84 6BQ5	NC	470K	150Ω	50Ω	50Ω	NC	†550Ω	NC	†2400Ω
V12	EL84 6BQ5	NC	470K	150Ω	50Ω	50Ω	NC	†550Ω	NC	†2400Ω
V13	EZ81 6CA4	105Ω	NC	¶ INF	50Ω	50Ω	NC	100Ω	NC	NC

ALL MEASUREMENTS MADE IN "STEREO AM-FM" POSITION.
† MEASURED FROM PIN 3 OF V13.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

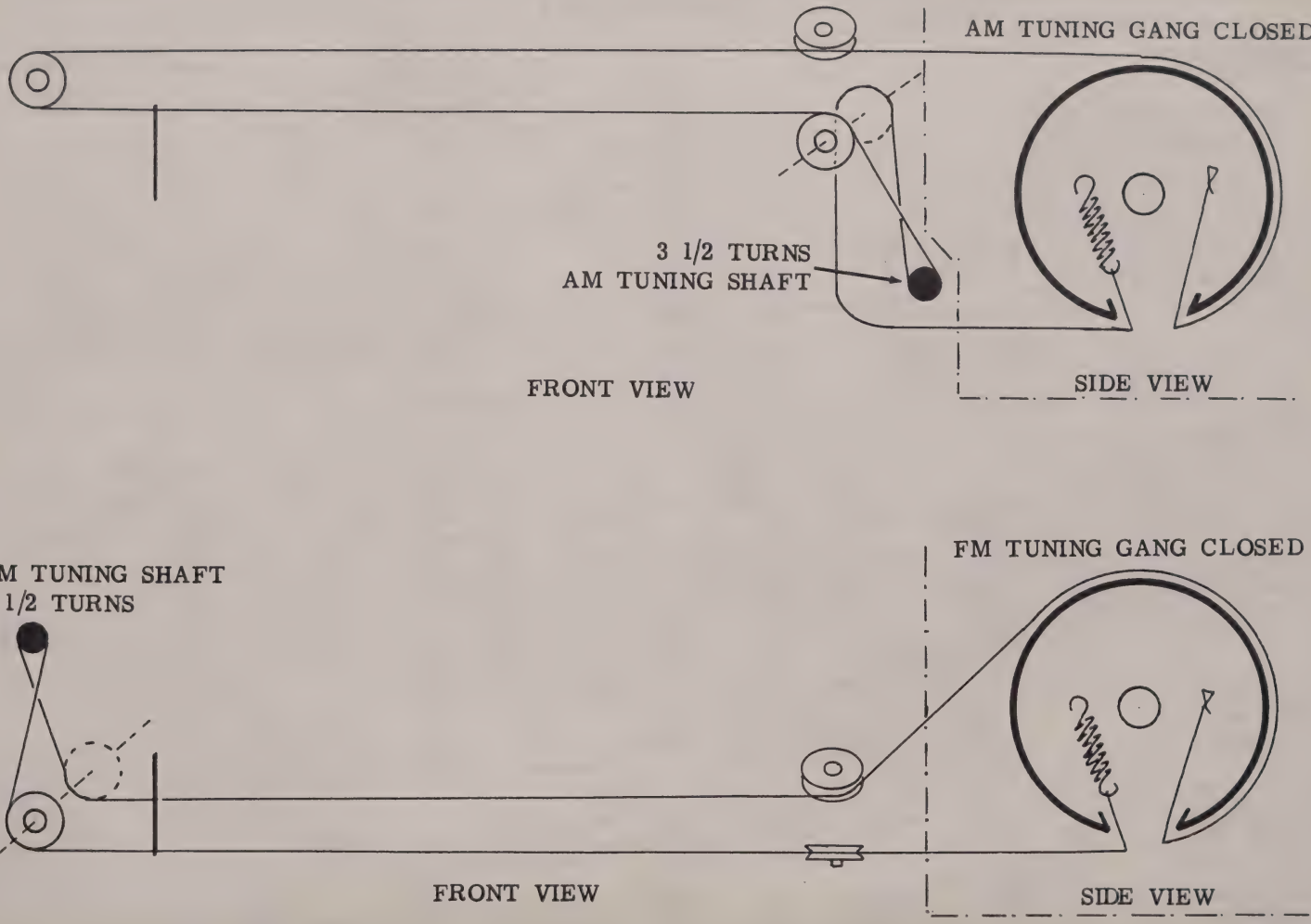
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1961

SILVERTONE MODELS 1065, 1067
(Ch. 528.54050, 528.59840)

AMP SCHEMATIC

SILVERTONE
MODEL 1065



DIAL CORD STRINGING

PHOTOFACT® Folder with CIRCUITRACE®

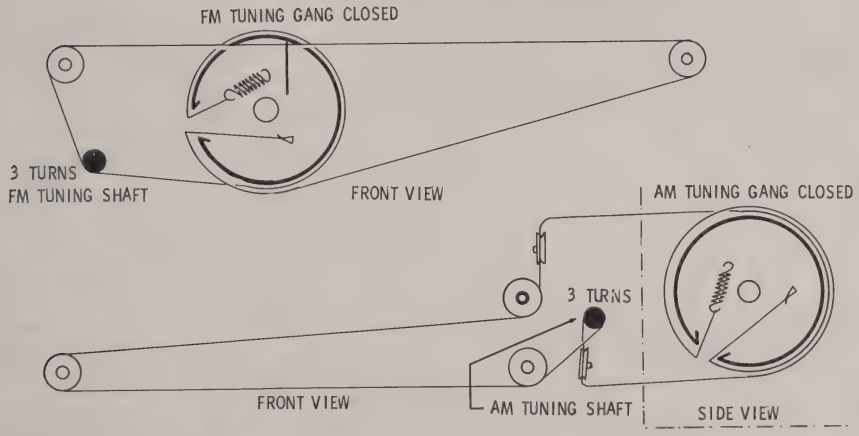
WEBCOR MODEL W304-1

WEBCOR MODEL W304-1

WEBCOR MODEL W304-1

TRADE NAME	Webcor Model W304-1		
MANUFACTURER	Webcor, Inc., 912 W. North Ave., Chicago 22, Illinois		
TYPE SET	AC Operated 9 Tube FM-AM Tuner		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	36 Watts, .34 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1600KC	FREQ. MOD.	88 — 108MC

DIAL CORD STRINGING

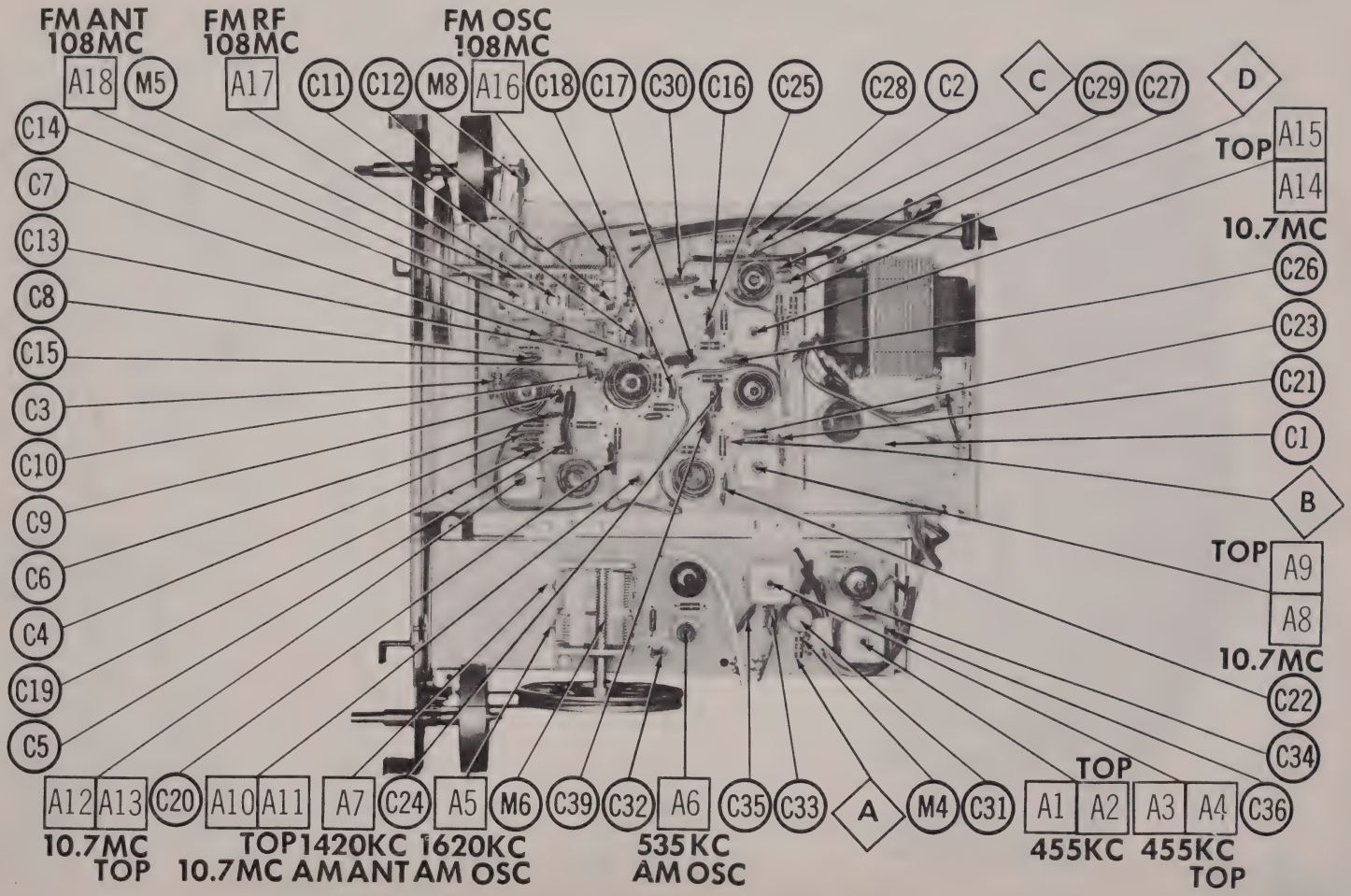


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KL404

SET 534 FOLDER 13



CHASSIS TOP VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A4, A6, A8 thru A15...GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A7, A16, A17, A18.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	535KC	Tuning gang fully closed.	"	A6	Adjust for maximum deflection. Repeat Steps 2 and 3.
4.	"	1420KC	1420KC Signal.	"	A7	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .001mfd to pin 9 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A14	"
7.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .001mfd to pin 9 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A14, A15	Adjust A14 for maximum amplitude and straightness of crossover lines. Adjust A15 so that marker occurs at center of crossover lines as in Fig. 2. Retouch A14 as necessary.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru 240Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓑ. Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
9.	"	88MC	88 MC	"	L4, L3, L1	Adjust for maximum deflection. Repeat Steps 8 and 9.

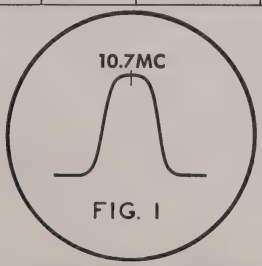


FIG. 1

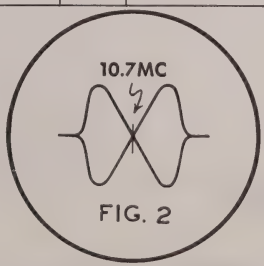
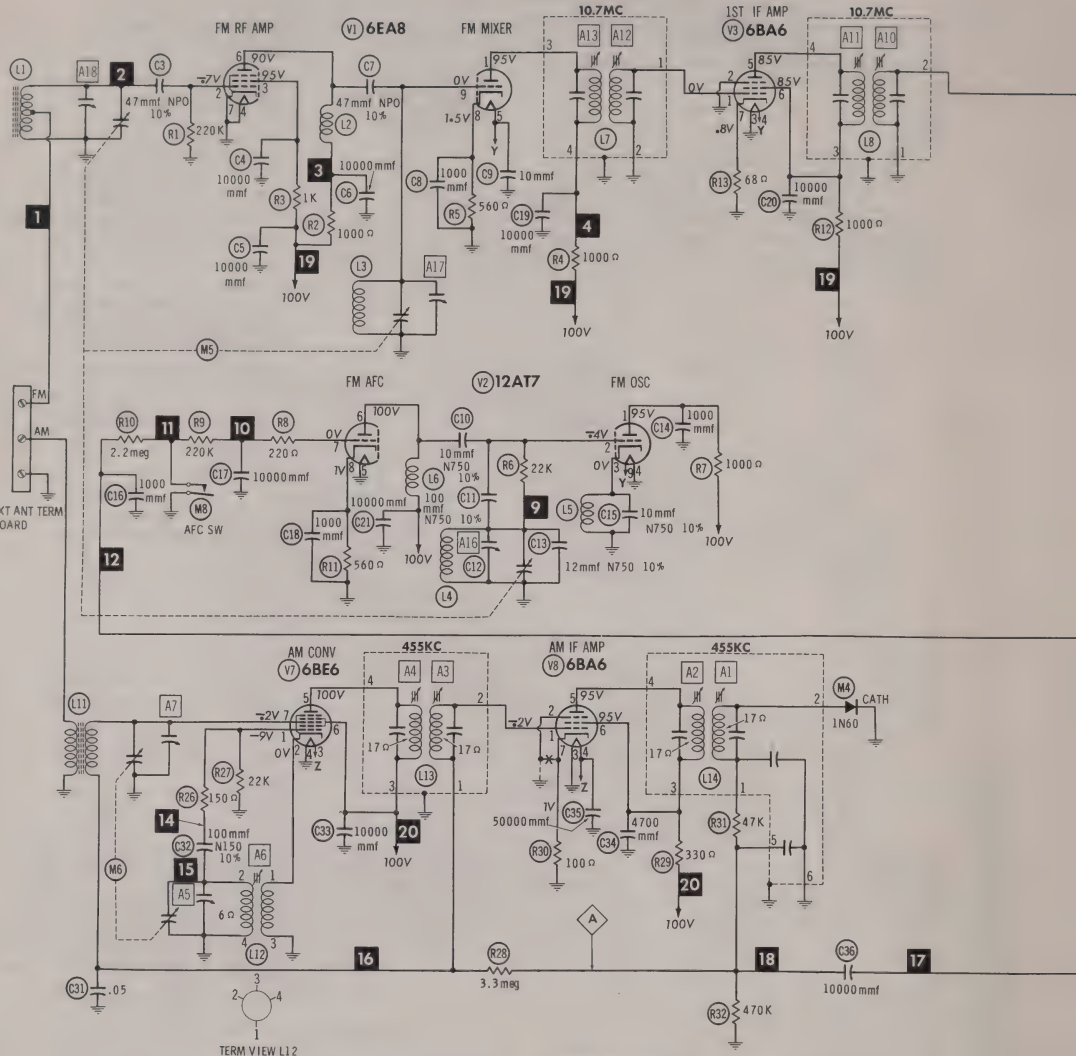


FIG. 2



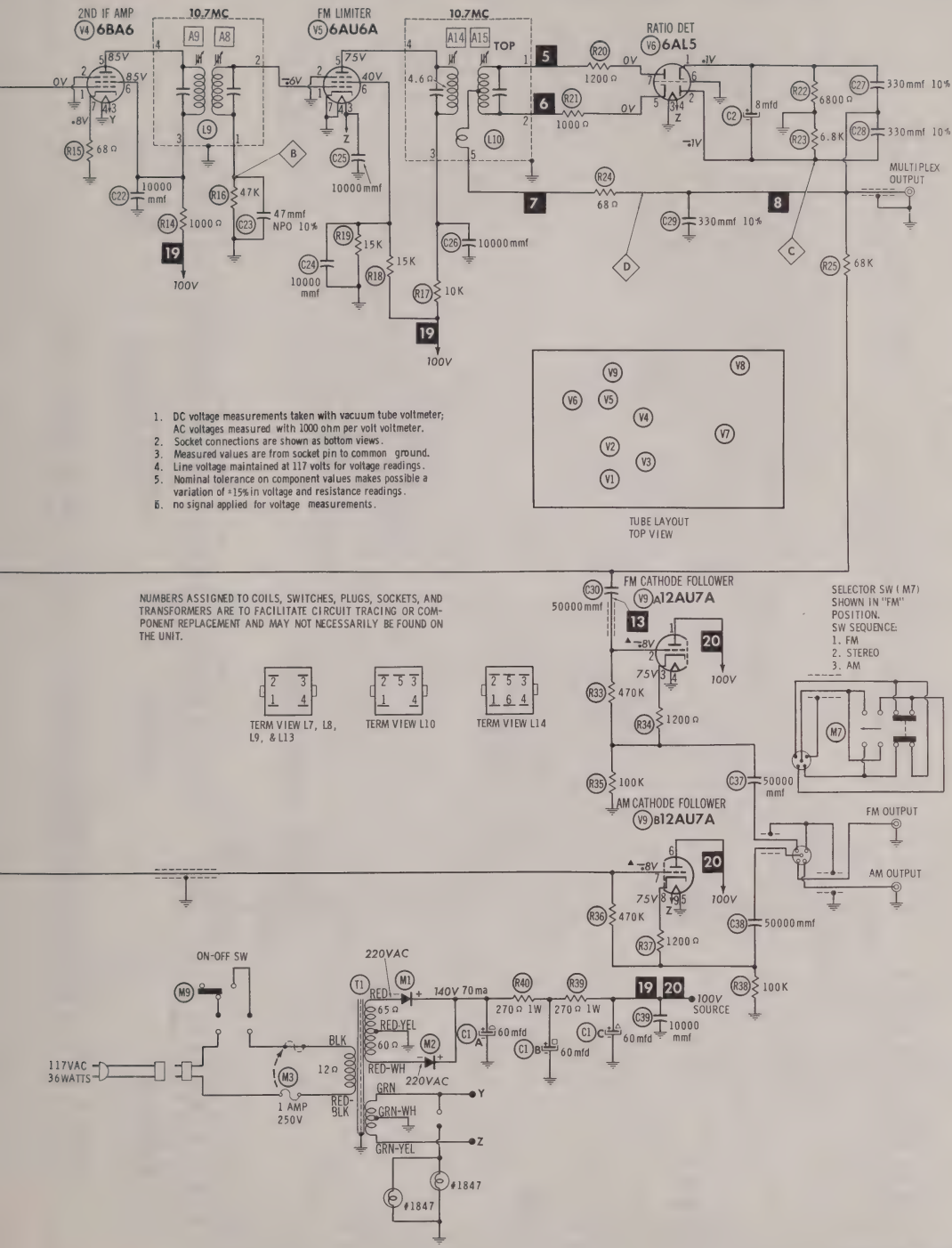
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EA8	†1500Ω	220K	†1500Ω	0Ω	.1Ω	†1500Ω	0Ω	560Ω	0Ω
V2	12AT7	†1500Ω	22K	0Ω	0Ω	0Ω	†550Ω	INF ▪220K	560Ω	.1Ω
V3	6BA6	.1Ω	0Ω	0Ω	.1Ω	†1500Ω	†1500Ω	68Ω		
V4	6BA6	.1Ω	0Ω	.1Ω	0Ω	†1500Ω	†1500Ω	68Ω		
V5	6AU6A	47K	0Ω	.1Ω	0Ω	†10K	†8000Ω	0Ω		
V6	6AL5	6800Ω	6800Ω	0Ω	.1Ω	INF ▪2.3meg	0Ω	INF ▪2.3meg		
V7	6BE6	22K	.1Ω	.1Ω	0Ω	†550Ω	†550Ω	3.6meg		
V8	6BA6	3.6meg	100Ω	0Ω	.1Ω	†850Ω	†850Ω	100Ω		
V9	12AU7A	†550Ω	570K	100K	0Ω	0Ω	†550Ω	570K	100K	.1Ω

ALL MEASUREMENTS MADE IN "STEREO" POSITION.
■ MEASURED WITH "AFC" OFF.
▲ MEASURED FROM CATHODE.
† MEASURED FROM OUTPUT OF M1 & M2.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

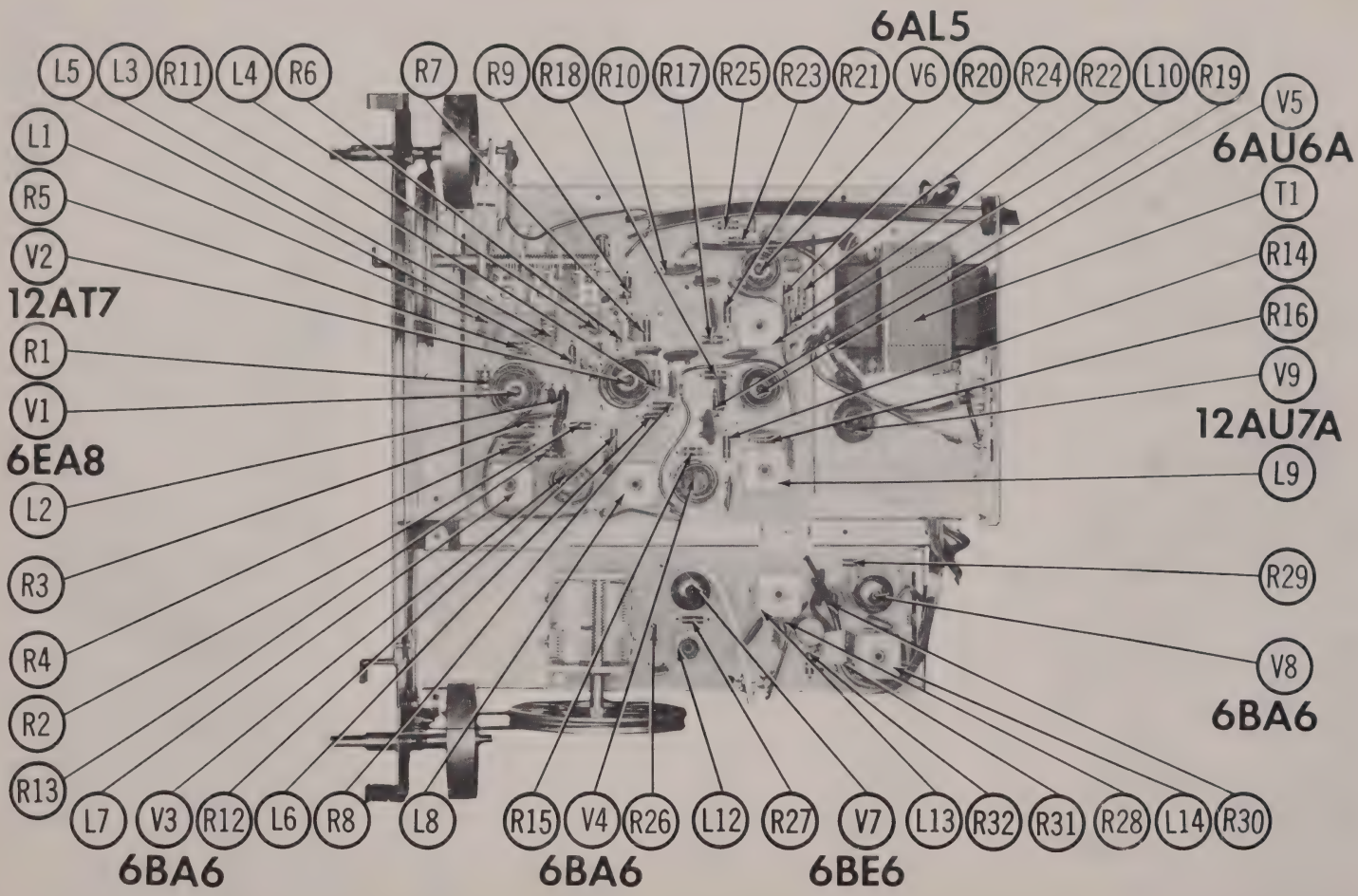
© Howard W. Sams & Co., Inc. 1961



WEBCOR MODEL W304-1

WEBCOR MODEL W304-1

FOLDER 13



CHASSIS TOP VIEW-RESISTOR, INDUCTOR & TUBE IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	FM RF Amp. -FM Mixer	6EA8
V2	FM Osc. -AFC	12AT7
V3	1st FM IF Amplifier	6BA6
V4	2nd FM IF Amplifier	6BA6
V5	FM Limiter	6AU6A
V6	Ratio Detector	6AL5
V7	AM Converter	6BE6
V8	AM IF Amplifier	6BA6
V9	FM Cathode Follower-AM Cathode Follower	12AU7A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	300	30P389		B0260		TMD-2320	TVL-2579	
B	■60	250			BR6025		TD-60-250	TVA-1513	
C	▲60	250							
C2	8	25	30P314	BCD25008	BBR8-150	TT25X8	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

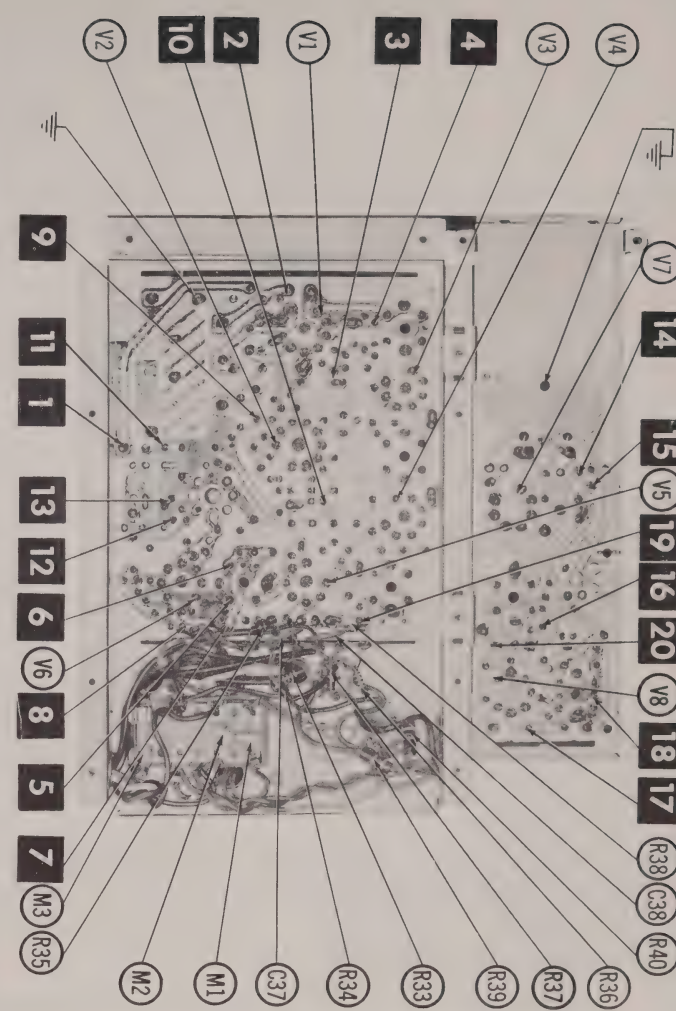
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	10		DI-10	DD-100	LI0QI	CCD-100	GP410	10TS-Q10
C10	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C11	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12		#30P392						
C13	12 N750 10%			TCN-12	C10Q12U		CN7-412	10TCU-Q12
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	330 10%		DI-330	DD-331	LI0T33	CCD-331	GP333	10TS-T33
C28	330 10%		DI-330	DD-331	LI0T33	CCD-331	GP333	10TS-T33
C29	330 10%		DI-330	DD-331	LI0T33	CCD-331	GP333	10TS-T33
C30	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C31	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C32	100 N150 10%	#30P282				*		10TCP-T10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	4700		BPD-0047	DD-473	BYA10D47M	CCD-472	B-247	5HK-D47
C35	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C38	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

Webcor Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



WEBCOR MODEL W304-1

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	220K			
R2	1000Ω			
R3	1000Ω			
R4	1000Ω			
R5	560Ω			
R6	22K			
R7	1000Ω			
R8	220Ω			
R9	220K			
R10	2.2meg			
R11	560Ω			
R12	1000Ω			
R13	68Ω			
R14	1000Ω			
R15	68Ω			
R16	47K			
R17	10K			
R18	15K			
R19	15K			
R20	1200Ω			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R21	1000Ω			
R22	6800Ω			
R23	6800Ω			
R24	68Ω			
R25	68K			
R26	150Ω			
R27	22K			
R28	3.3meg			
R29	330Ω			
R30	100Ω			
R31	47K			
R32	470K			
R33	470K			
R34	1200Ω			
R35	100K			
R36	470K			
R37	1200Ω			
R38	100K			
R39	270Ω 1W			
R40	270Ω 1W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		WEBCOR PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	FM Ant.	11X1977					
L2	RF Choke(3.3uh)	66P029	BC-564	4608	RTC-8518	T858	
L3	FM RF	66P027					
L4	FM Osc.	66P030					
L5	RF Choke (1uh)	66P028	BC-561	4602	RTC-8515	T855	
L6	RF Choke (1uh)	66P028	BC-561	4602	RTC-8515	T855	
L7	1st FM IF	69P019	FM-256	1463-PC	RTC-9046	T654	
L8	2nd FM IF	69P019	FM-256	1463-PC	RTC-9046	T654	
L9	3rd FM IF	69P019	FM-256	1463-PC	RTC-9046	T654	
L10	Ratio Detector	69P017	FM-257	1465-PC	RTC-9053	T659	
L11	Loopstick	65P165	BC-418	705-A		T523	
L12	Osc. Coil	65P146					
L13	1st AM IF	69P021	BC-356	13-PC1	RTC-8641	T614	
L14	2nd AM IF	69P022					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	WEBCOR PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .34A	220VCT @ .070A DC	12.6VCT @ 1.5A	68P091					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	WEBCOR PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.070A	65P155	1N1763	2F4	SR200	
M2	.070A	65P155	1N1763	2F4	SR200	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			WEBCOR PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	8AG	1A 250V	33P007		362001 (8AG 1A 250V)	387001	AGX1	4520

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		WEBCOR PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1N60	65P119		1N60	1N60	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M5	Tuning Cap.	11X2336	FM 3 Gang
M6	Tuning Cap.	30P391	AM 2 Gang
M7	Switch	32P163	Function Selector (4P3T Slide Type)
M8	Switch	11X2337	AFC (Includes Bracket, Contact & Spring Assy.)
M9	Switch	32P162	Power Off-On (SPDT Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

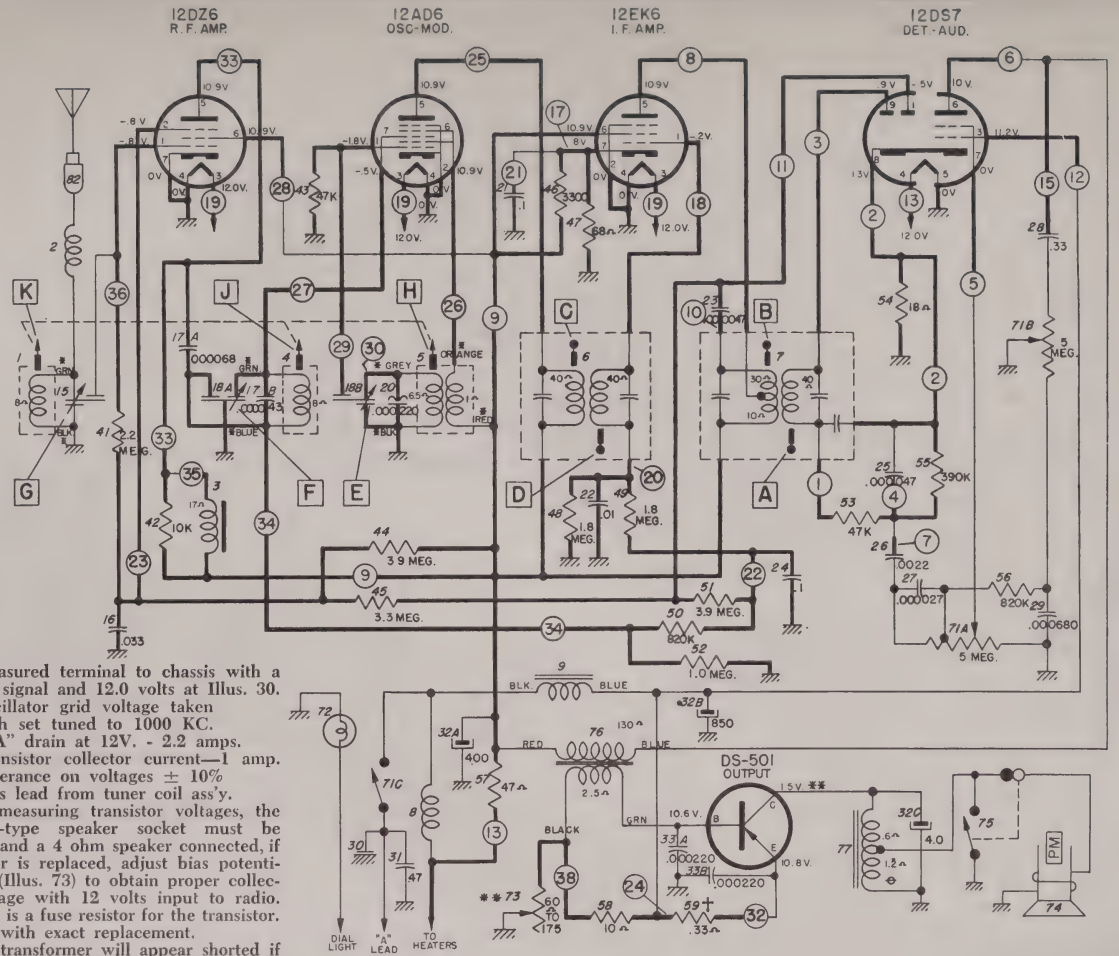
NAME	PART NO.	DESCRIPTION
Knob	39P227-10	Tuning
Cabinet	80X263-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

PONTIAC MODEL 989693



Voltages measured terminal to chassis with a VTVM—No signal and 12.0 volts at Illus. 30. Oscillator grid voltage taken with set tuned to 1000 KC.
Total "A" drain at 12V. - 2.2 amps. Transistor collector current—1 amp.
Tolerance on voltages ± 10%

°—Indicates lead from tuner coil ass'y.

°°—Before measuring transistor voltages, the shorting-type speaker socket must be opened and a 4 ohm speaker connected, if transistor is replaced, adjust bias potentiometer (Illus. 73) to obtain proper collector voltage with 12 volts input to radio.

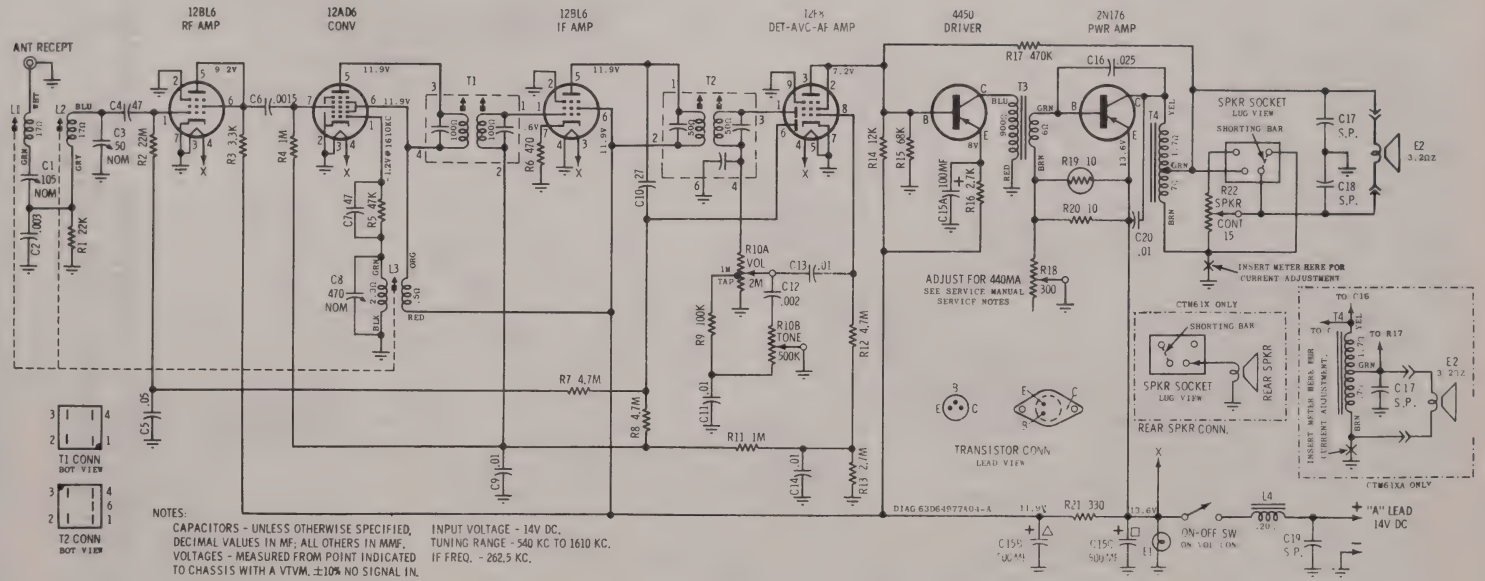
†—Illus. 59 is a fuse resistor for the transistor. Service with exact replacement.

⊖—Output transformer will appear shorted if shorting type speaker switch is not held open.

IMPORTANT

THE SPEAKER SOCKET, MOUNTED ON OUTPUT TRANSFORMER, IS A SHORTING-TYPE AND MUST BE MECHANICALLY OPENED WHEN TESTING RADIO ON BENCH.

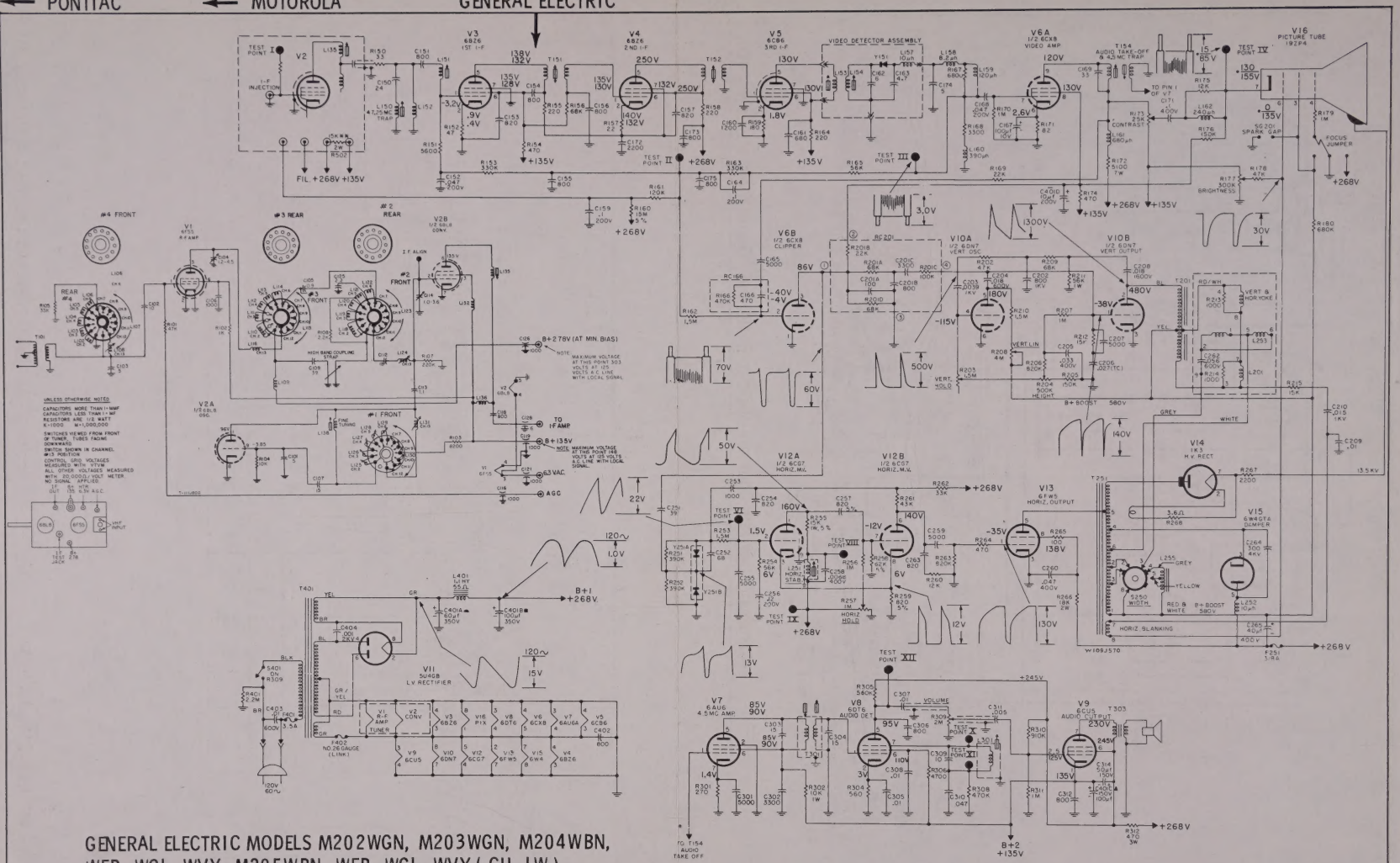
Schematic Diagram Courtesy of Delco Radio Div., General Motors Corporation



NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ±10% NO SIGNAL IN.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC TO 1610 KC.
IF FREQ. - 262.5 KC.

MOTOROLA MODELS CTM61X, XA

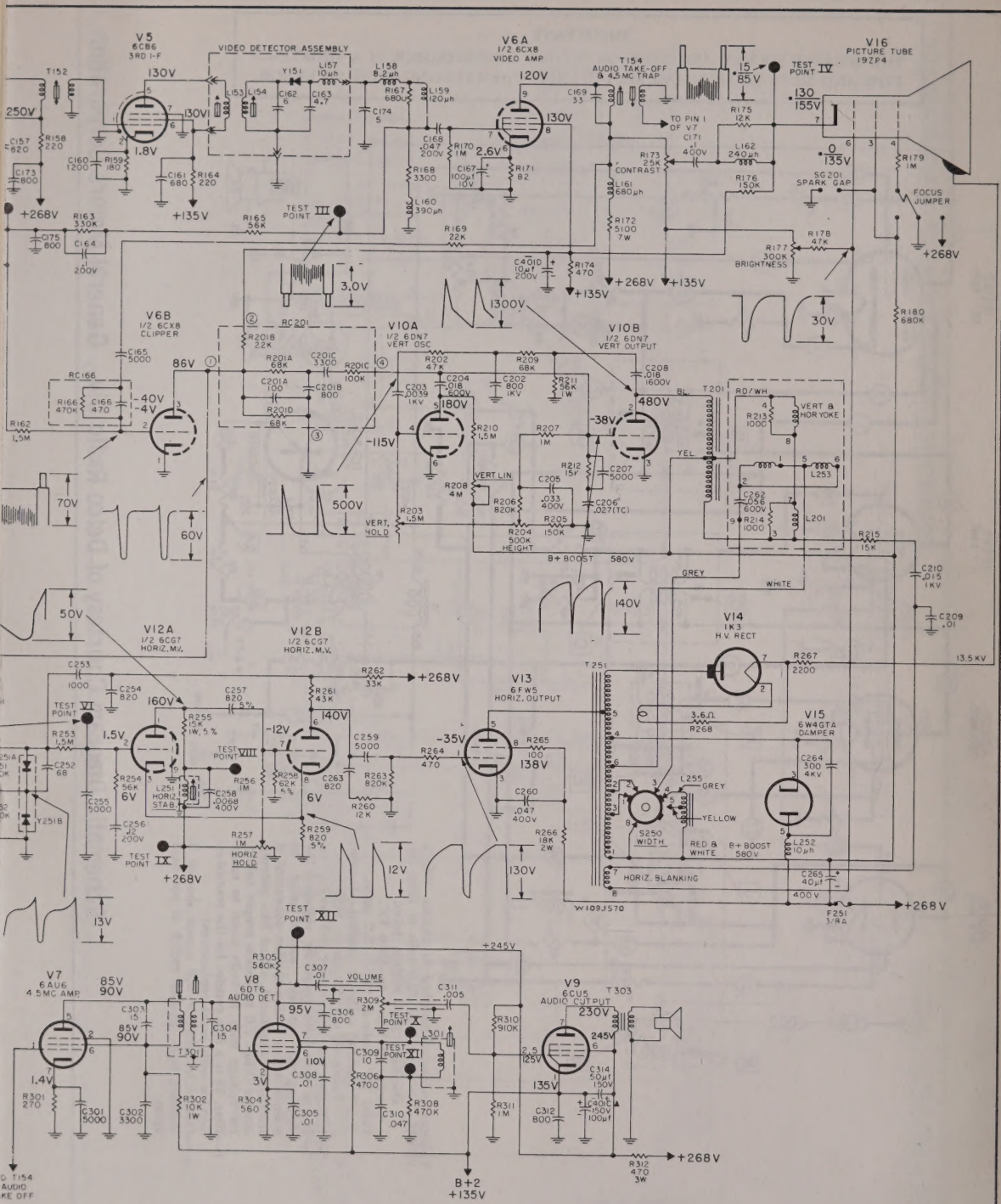
Schematic Diagram Courtesy of Motorola Inc.



GENERAL ELECTRIC MODELS M202WGN, M203WGN, M204WBN, WEB, WGL, WVY, M205WBN, WEB, WGL, WVY (CH. LW)

Schematic Diagram Courtesy of General Electric Company

©Howard W. Sams & Co., Inc. 1961



Schematic Diagram Courtesy of General Electric Company